MODEL AIRPLANE NEWS

IN THIS ISSUE

EXCLUSIVE PLANS FOR

BOB PALMER'S POW WOW

Super Stunt Job

•

World's Championship Glider

•

ALSO: RADIO CONTROL, BEGINNERS' MODELS, WORLD NEWS, ENGINE REVIEW

APRIL 1954 — 35 CENTS

Look Fellows!

A BIG 30 INCH PROFILE BASIC TRAINER

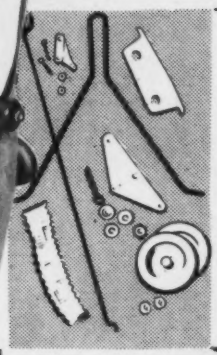
constructed to stand terrific abuse

$3.95

WING SPAN 30 inches
Engine .14 to .19 disp.

motor, flying equipment and liquids not supplied.

- **AMAZING FLYING ABILITY**
- **BEAUTIFULLY PRE-FABRICATED**
- **ALL NEEDED ACCESSORIES**
- **NEW FIXED FLAP DESIGN that eliminates offset rudder, offset motor and wing tip weight for easier flying.**
- **IMPROVED DESIGN of the very popular Trixter Trainer, developed by the knowledge obtained out in the field through study of the beginner's requirements.**



Here's what you get with this smartly designed kit:

Complete bellcrank assembly.
Elevator horn with mounting bolts.
Wheels. Wheelocks.
Hinging material. Finished push rod.
Finished landing gear.
Finished wing tip line guide.

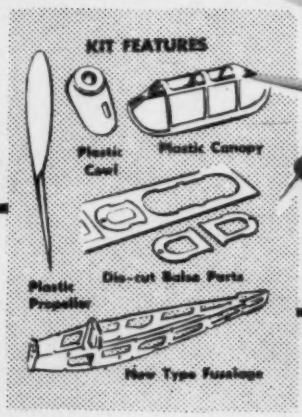
COMPLETELY PRE-FABRICATED. Hard wood motor mount. All can be assembled in a jiffy.

The Best Yet! Really New!
3 FLYING MODEL KITS

Ready for you at your hobby store.

Kit 50-1
North American Trainer T-28
16" Wing Span

These three additions to the Guillow fifty-cent line have the new one-piece side frame construction that saves you a lot of time. Note the gleaming plastic canopy, propeller, and cowl to give strength and beauty. All die-cut balsa construction. Clearly illustrated step by step plans will help you make a beautiful plane that is designed to really fly. If you want the best buy Guillow designed kits.



Kit 50-2
DeHavilland Chipmunk
17" Wing Span

Kit 50-3
Cessna L1 Bird Dog
18" Wing Span

50¢ each

Note large wing span.

Eight other models for your collection . . .
with all the features of the three new models but without one piece side construction and plastic canopy.

BRITISH SE-5
KIT 50-4

CESSNA
KIT 50-5

WACO CUSTOM
KIT 50-6

MONOCOUPE
KIT 50-7

ARRONCA CHAMPION
KIT 50-8

HAWKER HURRICANE
KIT 50-9

SPITFIRE
KIT 50-10

VOUGHT CORSAIR
KIT 50-11

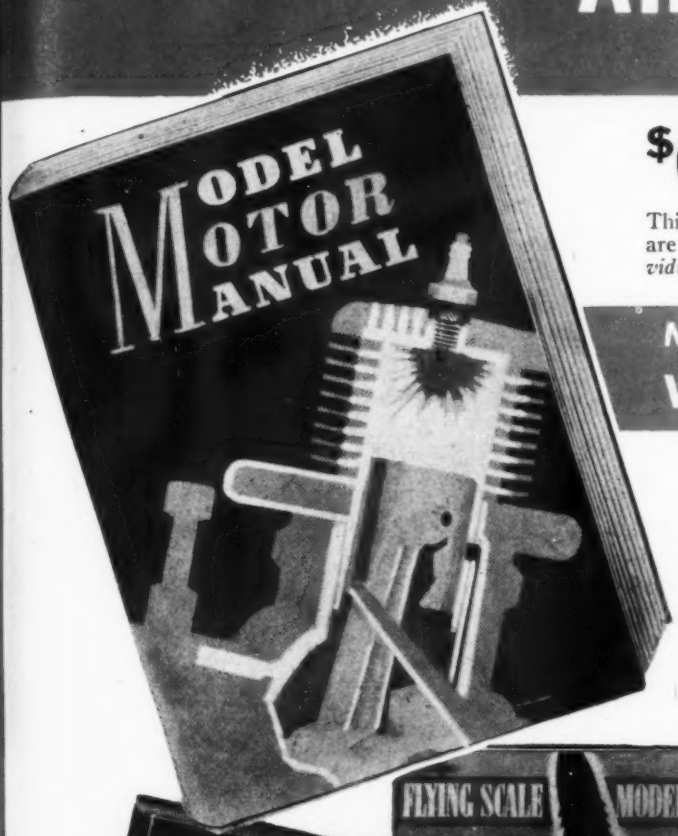
GUILLOW'S

If not available at your Hobby Dealer, send direct to factory adding 25c for packing and postage in U. S. A., 40c outside U. S. A.

PAUL K. GUILLOW

WAKEFIELD, MASS.

LESS THAN 1/2 PRICE FOR THREE AIR AGE BOOKS



$6.50 VALUE NOW $3.00

This $3 Combination Offer prevails when all three books are purchased as *one unit*. Books may be purchased *individually* at exactly one half off the original list price.

MODEL MOTOR MANUAL
WAS ~~$3~~ NOW $1.50

CONTENTS

The Ignition System	Compression	Testing Plane Performance
Types of Model Motors	Care of the Motor	Model Motors of the Future
Engine—Upper Half	The Flight Timer	Home and Factory Repair
Engine—Lower Half	The Propeller	A Simple Engine Test Mount
Ignition Timers	Making Accessories	Operation of the Model Motor
The Sparkplug	Testing for Performance	Fuel, Lubricant and Carburetion
Coil and Current	Four-Cycle Motors	Engine Operation (Oil & Gas)
Wires and Connections	Diesel Motors	Trouble Shooting After Installation
Starting the Engine	Multi-Cylinder Motors	Advancing & Retarding Spark
Trouble Shooting	Choice of Motor	Basic Principles of the Motor

MODEL MOTOR MANUAL is no small booklet—it is beautifully bound in cloth and gold stamped. Contains 228 pages, 6 x 9 inches . . . 112 highly skilled detailed drawings and photographs. Technical terms are avoided whenever possible since this book is intended for the beginner as well as the expert.

FLYING SCALE MODELS
WAS ~~$1.50~~ NOW 75c

16 SCALE MODEL FLYERS

by Earl Stahl, H. K. Weiss & Sidney Struhl

Here is a collection of 16 military ships IN SCALE for real FLYING! Each of the sixteen is covered in full. There are detailed plans & photos of the finished and partially finished planes, together with complete step-by-step instructions for doing a fine job in the easiest yet surest manner for best results. The special section of "Plane Tips" is especially helpful.

TABLE OF CONTENTS

Brewster Fighter	Airacobra
Model Mustang	Hurricane
Torpedo Bomber	Attack Bomber
Navy Scout	Curtiss Scout
Spitfire Miniature	Hawk P-40D
Grumman Wildcat	Grasshopper
Vultee Vanguard	Russian Fighter
Messerschmitt	Air Bombs
Douglas DB-7	Plane Tips

AIR AGE GAS MODELS
WAS ~~$2~~ NOW $1

PLANS & PHOTOS FOR 21 GAS MODELS!

A full set of Complete Gas Plans plus actual photos, etc., by America's foremost gas modellers. This book contains a priceless collection of plans gathered over a period of several years. All plans are clear, sharp, and accurately scaled. Some of the material included is by world-famous designers Struck, Goldberg, Shulman, Stahl, Ehling, Kovel, Weathers and many others. It's a real GAS plan book—only one of its kind.

MODEL AIRPLANE NEWS, 551 Fifth Ave., New York 17

Enclosed find $..... Please send me:

( ) 3 Air Age Books for $3.00
( ) Model Motor Manual for $1.50
( ) Flying Scale Models for 75c
( ) Air Age Gas Models for $1.00

Send to.....

Address.....

City.....Zone.....State.....

MODEL AIRPLANE NEWS

25th Year of Publication

APRIL 1954 Vol. L—No. 4

CONTENTS

CONSTRUCTION

Pow Wow 14
World Championship Glider . 18
High Diver 23
Ugly Duckling 30

ARTICLES

Boom in German Engines . . 11
Should We Scrap Microfilm? . 16
Tissue Happy 20

FEATURES

MAN at Work 2
Handley Page Victor . . . 9
Tuning for Speed 22
Radio Control News . . . 26
Veco .29 27
Fox .19 32
Flash News 33
Foreign Notes 34
Trade Tricks 51

JAY P. CLEVELAND, President and Publisher
WILLIAM WINTER, Editor
WITTICH HOLLOWAY, Art Director

Contributing Editors: Peter Chinn (England), Don Grout, Ed Lorenz, Ted Martin, Bruce Wennerstrom, Harry Williamson

Executive and Editorial Office: 551 Fifth Avenue, New York 17, N. Y.

Advertising Manager, N. E. Slane, 551 5th Ave., New York 17; West Coast Adv. Mgr., Justin Hannen, 4068 Crenshaw Blvd., Los Angeles 43, Calif.

Editorial and Business offices: 551 Fifth Ave., New York 17, N. Y. Published monthly by Air Age, Inc., 1140 East West Highway, Silver Spring, Maryland. Jay P. Cleveland, President and Treasurer; Y. P. Johnson, Vice Pres.; O. E. Johnson, Sec. Entered as second class matter Feb. 1951 at the post office at Silver Spring, Md., under the act of March 3, 1879. Additional entry at New York, N. Y. Price 35c per copy in U. S. Subscription Prices—U. S. and possessions: 1 yr. $3.50; 2 yrs. $5.50; 3 yrs. $7.50; Canada: 1 yr. $4.00; All other countries: 1 yr. $5.00. Payment from all countries except Canada must be in U. S. funds. Change of Address—Send to MODEL AIRPLANE NEWS, Subscription Department, 551 Fifth Avenue, New York 17, New York, at least one month before the date of the issue with which it is to take effect. Send old address with the new, enclosing if possible your address label or copy. The Post Office will not forward copies unless you provide extra postage. Duplicate issues cannot be sent.

Copyright 1954 by Air Age, Inc.

by William Winter

One of these days some manufacturer is going to discover that many of us are thirsting for more and better flying scale stuff, mostly with Half-A power. Good designs are as scarce as dihedral in a U-control job. Certainly, the magazines get to see very few. Oh, there are some flying scale gas jobs available, as, for example, Berkeley's, but the trade plays it safe with the captive, carved wood variety of design. So, while scale fans are staggering across this dry desert, they keep their minds off their thirst with a perpetual argument over rules and specifications.

Chuck Wood, on behalf of a Pacific Northwest group, as recently reported in this space, loosed a blast of birdshot in the general direction of the rules committee britches. This induced one rules committee member to come in out of the sun long enough to fill us in on the "big picture." Listening to Bob Hatschek, was struck with the novelty of a rules committee man refusing to take it on the chin. Are all AMA dignitaries supposed to turn the other cheek?

The committee was composed of Bill Fletcher, the Wakefield team manager; T. R. Quermann; Lew Mahieu, top speed and free flight man for years and now active in engine manufacturing; Louis Culler, 1952 Nationals flying scale winner, Open Class; Dan Lutz and L. W. Puncher, both known for scale work; and Hatschek. Now here was a committee with heavy representation from both East and West—informed, skilled fliers. Did they go wrong? Could they have gone wrong? Or does our rules-making system need a going over?

The scale committee apparently considered itself bound by the 1952 rules ballot. Critics, including the writer, who wondered whose brilliant idea it was to limit FF scale to Half-A motors, now have their answer. To the ballot question, "Do (*Continued on page* 4)

PLANE ON THE COVER

The Douglas F4D, aptly named the Skyray, is the subject this month of cover artist Jo Kotula's brush. Together with the Cutlass, the Skyray emphasizes the Navy's interest in advanced designs, both being all-wing or tail-less aircraft. Among the world's fastest airplanes, the F4D attained, last October 3, an official measured speed of 753.4, setting a world record for a service type aircraft. This early version of the swift Douglas was powered with a J-40 turbojet with afterburner, but production jobs will have still more powerful engine installations.

NEXT MONTH'S COVER

One of the greatest of all World War I airplanes, and a machine never to be forgotten, the French Spad distinguishes the May cover. Americans recall the Spad mostly because of the Hat-in-the-Ring Squadron, in which Eddie Rickenbacker became our leading ace. Span of this equal wing biplane was a mere 26 ft. 5 in., while power was either a 200 or 220 hp Hispano Suiza liquid-cooled engine. Had twin .30 caliber guns.

Announcing 2 New OK Winners!

For PRICE, POWER, and PERFORMANCE

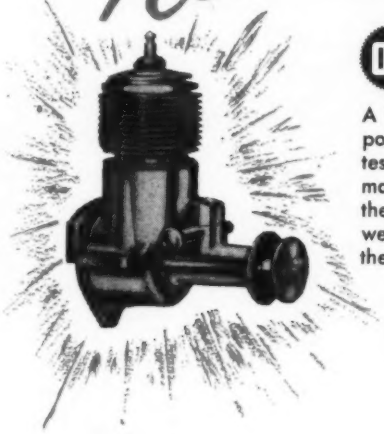
17TH ANNIVERSARY OK 1937 • 1954

A Complete Line of PROVEN Miniature Engines and Accessories

"OK" GLOW FUEL
"OK" DIESEL FUEL
Pint 85¢

"OK" GLOW PLUGS
Short or long — 59¢

1 New Engine



OK CUB .19

A WINNER . . . FOR POWER! This powerful new Cub is ideal for contest entries. Engineered to provide maximum Class A performance. Has the highest output on a power/weight ratio of any engine now on the market!

Displ.	.199
Bore	.655
Stroke	.590
Weight	2⅞ oz.

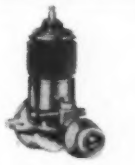
$8.95
As illustrated

"OK"
CUB .049B
$4.95

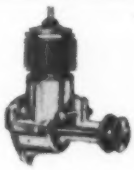
"OK" CUB .074
$5.95

To make sure your Cub's a winner, always use "OK" Glow Fuel. A methanol-base fuel with extra punch. Assures quick firing, complete combustion — leaves no varnish or residue.

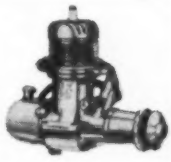
85¢ Pint



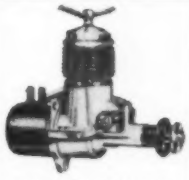
"OK" CUB .099
$6.95



"OK" CUB .14
$7.95



"OK" HOTHEAD
$10.95



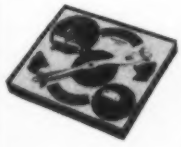
"OK" CUB DIESELS
.049 $5.95
.075 $7.50

2 New Kit

OK CUB .049B POWER KIT

A WINNER . . . FOR PRICE! Enjoy the thrill of assembling your own engine—and save money at the same time! Kit contains all the parts you need and easy-to-follow instructions.

only $3.95



"OK" COMBINATION PACKAGES
CUB .049x $5.75
CUB .074 . . . . . $6.75
CUB .099 . . . . . $7.75

SEE YOUR DEALER . . . Or write us direct

HERKIMER TOOL & MODEL WORKS

88 Harter St. Herkimer, N. Y.

MAN at Work

(*Continued from page 2*)

you favor eliminating flying scale rubber and adding in its place flying scale Half-A gas?" 642 people answered yes, while only 160 said no. Half-A gas was practically a mandate. But there is a sort of "have you stopped beating your wife" aspect to questions like this, as will be remembered from an earlier ballot that determined the present rubber rules, weight and size. A man might have wanted Half-A scale, but suppose he did not want to drop rubber? Or suppose he wanted a different displacement limit on gas, say, .09? Then he found the answer-yes-or-no stuff frustrating. Four hundred and twelve people favored more construction points, and less for flying time; while 325 said no. In favor of adopting the Half-A flying scale rules at the 1952 Nationals were 289; opposed, 281. Favoring a committee, which implied the need for new rules, were 635, while 74 were happy "as was."

The really controversial point in the resulting rules put together by the committee was the ratio multiplication system. Many builders say it is complicated; others, that it is not detailed enough! Some say it leans toward flying; others, that it favors construction. Scale points and the flight ratio are multiplied together. Everyone interprets the rule as an advantage for a poorly built airplane lucky enough to snag a thermal. Asked about this, Bob said, "The rule allows the builder to choose between a good flying plane and a well detailed one. The guy who can build a good flying, well detailed plane would have a tough time losing a contest. If a poor flight is made, the rule means that scale points can pull up your score." You can multiply 3 x 2, or 2 x 3, and come up with six either way, so what's the difference, asks he?

To the Skyhawks' argument for more freedom on power source, the phrasing of the question on the ballot resulted in that 642-160 vote in favor of Half-A. It could not come out any other way. A new vote might be different but it was the last ballot that the committee had to conform to.

Bob sums this up pretty well. Ideas are needed before a ballot can be sent. You direct suggestions now to the Contest Board members in your district, or to AMA headquarters, or don't squawk later.

If you think this is a tempest in a tea pot, consider that the British might be chasing bandits through the jungles of Malaya, but that C. F. Stuby, Kuala, Lumpur, Malaya, wants to know how come the Half-A limit in our flying scale rules. While you are at it, keep in mind the many nations who, with growing model movements, and no rules of their own, base their rules upon ours.

"Restricting flying scale free flight to Half-A engines narrows the scope of design considerably," argues Stuby. "I have no idea how the Half-A limit was set but it seems to me that if the engine class restriction were removed, and the aircraft judged solely on their scale fidelity and flying ability, contest interest in this type of model would expand considerably. Also the larger models would be easier to adjust and fly." Stuby goes on at length about the dearth of the equivalent in suitable flying scale plans of Wylam drawings. How right he is.

Being an old war-horse ourselves, it seems to MAN at Work that flying scale designs are too small, even for the Half-A engines. The Nationals usually produce a few first rate flights, and we do mean few, and a lot of nice looking but impractical machines. Someone has the cart before the horse. Too much influence to make scale rules fit the manufactured products. What kits are available, the rules maker usually asks himself? Have to popularize this thing, you know. Now we are the last to urge continuously changing the rules to drive the manufacturers into the meat tenderizer business but this particular argument doesn't stand up. Here's why. A plane wins the 1954 Nationals. A kit manufacturer puts it on the market. Swell. But then, in 1960, the rules makers are dominated by that 1954 type kit. Where does progress come in when a popular movement is encouraged, but then tied to old designs. If the rules have to be changed, in the name of common sense, change them. Anyway, it will give the manufacturer a new kit subject. That he will like.

* * *

▸ Remember Johnny Davis, who used to do a report from the West for MAN? Last time we saw Johnny was at the Minneapolis Nats in 1947. John, Jim Walker tells us, had been in Japan and Korea for three years. On the way through Portland, he phoned Jim who said he was going to send him something. When Jim decides to give you a present, a giant size carton arrives, stocked with everything from a Fireball to a couple dozen each of various gliders, helicopters, Hornets, Interceptors, couple of Firebaby's, and so on. To Johnny, who had last seen a Fireball, much of this new stuff was an eye popper. Having been the recipient of one of these gifts ourselves, can tell you it results in an air-minded neighborhood and a flock of new customers for the hobby shop.

Says Johnny, "The Ceiling Walker was ridiculous . . . constant source of amusement as well as amazement that it even flies . . . powered Firebaby terfific in performance . . . all the kids are glider pilots now."

Jim is going to make a tour of Europe in 1955, with all his acts, three Fireballs at once, Sabre dances, balloon breaking, sonic control, and a host of others. Wait until this ambassador of good will gets on the job! But we're forgetting Johnny Davis. Good to have you back, Johnny! Korea reminds us of a chap from Connecticut who was told to follow a path at night to some outpost. Mortar fire kept him hitting the deck. Finally, he heard this strange buzzing noise. No Chinese bugle blowing this. Maybe some secret weapon. Every time the noise would stop, he'd sneak nearer to the outpost. Finally, he made the break, and found a bunch of guys running a Baby Mac. Real Stateside stuff, the Loot told him.

* * *

▸ Dick Schumacher now a consulting engineer on the staff of Babcock Radio Engineering. Dick is an airline captain, a one time Wakefield team member, RC rules committee member . . . Hi Johnson says to put 6° downthrust on your Buzzer'd models for best flying. Accounts of our winter flying remind him of his early building in Brigham City, Utah, where he was born.

"My building was done in in an attic that was either 40 below or 120 above, but I enjoyed it," says Hi. You've got us stopped, boy . . . Ed Dolby, Boston, reports development of the Boston Program idea (see MAN, 1/54, p. 22). "Lots of things in the works," says he. "One is sponsorship by a national organization that has halls in all the major cities. If this organization helps in Boston, it would be a natural for this type of thing, nationally, each year." Ed's bunch also working on few new simple designs, planning further experiment to find out what kids can build most easily and what flies best. Recently mailed 1,000 stick plans and 1,000 glider plans. That's the stuff, Ed! . . . Another Massachusetts man, Lee Renaud, talked most of the morning about limited rubber (had swell lightweight ship with him) and that mysterious Folly design. We predict the high thrustline jobs will soon make obsolete the conventional pylons. Want to bet? Paul Gilliam raving about Casselberry's high thrustline shoulder wing job. Will have this in the mag one of these days.

(*Continued on page 8*)

BEST for building Monogram Models!

15c Large Tube ★ Perfect Products for Monogram Plastic-Balsa and All-Plastic Kits ★ One Ounce Jars 15c

A Perfect Job Every Time on Wood, Tissue, Cloth, Metal and Acetate Plastic

Use Mono-Glue and Mono-Dope to build the Monogram plastic midget racer and the new Superkit models shown on the opposite page. *The exact colors you will need are shown on the plans.* No special enamels or plastic cement required for these or any Monogram model. You'll like these fine products for other model building jobs too. Mono-Glue dries fast and really holds. Mono-Dope in 19 authentic colors and finishes goes on easy for a hard, smooth and brilliant finish.

At Your Favorite Store

Mono ★ Dope
Mono ★ Glue

Monogram Models, Inc. • Chicago

NEW! *Packed With Fun!*

Monogram Models

All Plastic and Famous Monogram Plastic-Balsa Combinations!

Super Detailing!
Amazingly Realistic!
Beauty Beyond Comparison

Has realistic dummy Offenhauser engine, exhaust pipes, removable hood, brake, pump, helmeted driver and detailed instrument panel. Parts press-fit and snap-fit together QUICK.

Complete Kit **98¢**

ALL PLASTIC
Midget Race Car

It's a true scale Midget Racer just like the real ones used in indoor and outdoor racing. More authentic detail than you would expect on a model at this price. All parts are molded acetate plastic. You can assemble this model with Monogram's Mono-Glue in a matter of minutes. For painting, use Mono-Dope. Colors — Black, Silver and your favorite body color.

Superkit MiG-15

23 Molded Plastic Parts

Finished Balsa Fuselage, Wings, Tail

This is an authentic Russian MiG based on the recently captured "$100,000" real aircraft. You've been waiting for this nifty model for a long time. It's real fun putting together the 23 plastic parts and 6 finished balsa parts with Monogram's Mono-Glue. Finish the model with Mono-Dope. Colors — Silver, Red or Black.

Complete Kit **89¢**

Complete Kit **89¢**

Superkit Sabre Jet

18 Molded Plastic Parts

Finished Balsa Fuselage, Wings, Tail

Here it is, fellows! The F-86 Sabre Jet — the kit so many of you asked for — in the popular Superkit series. 18 molded plastic and 6 finished balsa parts go together in a jiffy and give you the last word in detail and realism. Use Monogram's fine Mono-Glue for assembly. Finish with Mono-Dope. Colors — Red Black, Silver.

If no dealer near you order from address below. Add 25c to cover cost of packing and postage.

Monogram Models **3421 WEST 48th PLACE • CHICAGO 32**

AHC ... the HOBBYIST'S SUPERMARKET of SUPER SAVINGS!

NOWHERE IN THE WORLD will you find as large a selection of AIRPLANES • ENGINES • SPEEDBOATS RACE CARS • ACCESSORIES • ETC. CHECK THIS LIST!

AIRPLANES

FREE-FLIGHT PLANES

Baby Zephyr 28" AA ..... .98
Bellaire 72" A-B-C 5.98
Boomer 44" AA 2.98
Bird Dog 36" FF AA 2.98
Bootstrap 40" AA 2.50
Buccaneer Jr. Special 84" B 3.95
Champion 36" A-AA 2.50
Clipper 34" AA 2.98
Cloud-Coaster TR 28" AA 2.50
Cloud-Coaster D 26" AA 2.98
Commando 18" AA 2.75
Dakota 24" AA 2.75
Dolly 32" AA 1.98
Fa-bee 36" AA 2.98
Fa-bee 66 66" B-C 6.98
Hawk 27" AA 1.50
Heliocopter 39" AA 3.95
Jesco Ring! 44" AA 2.98
Jesco Streak 32" AA 1.95
Junior Phoenix 36" A 2.25
KIWI 28" AA ..... .50
KIWI 44" A 4.50
KIWI ABC 61" A-B-C 9.95
Lift Master 34" AA 2.25
Lil Rascal 27" AA 1.50
Lucombe Sedan 76" C-D 7.50
Mini-Hogan 24 34" AA 1.95
Mini-Hogan 40 40" AA 2.98
Navajo 36" AA 2.50

Buried in This Ad

are most of the new items. Sometimes there isn't time or space to list all of them. But, if available anywhere, we have it.

PAA Master 36" AA 2.50
Pacemaker 40" AA 2.25
Phoenix Flash 32" AA 1.75
Phoenix Skipper 34" AA 2.25
Powerhouse 33" AA 1.75
Powerhouse 41" A 2.95
Powerhouse 48" B 3.95
Privateer Flying Boat 36" FF AA 2.95
Profile Powerhouse 24" AA 1.00
Sandy Hogan 70" B-C 5.95
Shadow 32" AA 1.95
Show 36" AA 2.75
Skylark 31" AA 2.00
Sniffer 29" AA 1.75
Super Breadwinner 56" B 4.95
Sprint Cub 35" AA 2.95
Twin 23" AA 2.50
Zeet 33" AA 2.50
Zeet 50" AA 4.95

RADIO CONTROL PLANES

Piper Tri-Pacer 79" A-B-C 10.95
Boattrack "A-BC" 54" AA-A 3.95
Brigadier RC 38" AA-A 4.95
Bushmaster 52" A-B-C 10.95
Kitten 34" AA 3.95
Livewire RC 48" A 6.98
Livewire Sr. 68" A 14.98
Buccaneer Jr. Special 56" B 3.98
Buccaneer Jr. Special 72" C 7.98
Super Brigadier 58" B-C 4.98
Super Buccaneer 90" C-D 10.98
Custom Cavalier 108" D-E 17.80
Lascombe Sedan 76" C-D 7.80

U-CONTROL PLANES

A/2 Twin 25½" AA 2.95
Aerance Sedan 30½" A-B-C 4.98
Aerance Sedan 22" AA 1.95
Aeronite 17" AA 4.98
Air Racer 18" AA-A 3.29
All Amer. Trainer 21" AA 1.79
All Amer. Stunt 36" A-B 2.50
All Amer. Jr. Stunt 21" B-C 4.98
American Boy 18" AA 1.00
Baby Barnstormer 23" AA 2.95
Baby Clipper 22" AA 1.50
Baby Sto 18" AA-A 2.50
Baby Stro Bee 16" AA 2.50
Barnstormer 47" A-B 8.95
Bearcat, Jr. 20" AA-A 1.50
Bearcat 38½" C-D 4.98
Beechcraft 16" AA-A 2.95
Bel-Air 18" AA-A 2.50
Bee Stunt Twin 22" B-C-D 3.98
Beeline P-80 17½" AA 2.98
Beeline P-80 24" A 3.95
Bravo 36" A-B-C 4.75
Cal's Whiskers 40" A-B-C 3.95
Cessna 22" AA 1.98
Cessna 36" B-C 5.98
Chief B-C 5.98
Circus King 40" B-C 5.95
Combat Sky Bee 36" A-B 2.95
Corsair 17" AA-A 2.95
Curtis P40E 20" AA 2.98
Curtiss Hawk P6E 17½" AA 2.95
Curtiss Hawk P6E 23½" A 4.98
Dynamic 26" A-B 3.80
Fire Baby 19" AA 2.50
Firebaby (incl. Engine) 7.88
Firebaby Biplane 19" AA 3.50
Firebaby Biplane (incl. engine) 9.78
Flip-Flop 24" A-B 3.50
Flying Clown 28" A-B-C 1.98
Focke Wulfe 190 17" AA 2.98
Fokker D-VII 23½" UC A-B-C 5.95
Fokker D7 14" AA 2.98
Gabel Tailee Trainer 27" A-B 5.95
Good News 30" A-B-C 5.98
Goodyear Stunt 24" A-B-C 3.95
Guided Starlet 24" AA 2.75
Hall—Racer 9" AA 2.00
Hall—Racer 16" A 5.95
Hall—Racer 18" B 6.50
Hall—Racer 18" C 8.95
Howard Ike 20" AA 3.00
Howard Pete 30" B-C-D 5.95
Infant Wagon 20" AA 1.98
Junior Stunt 9 27" AA-A 3.48
Junior Stunt 10 34" A 3.98
Junior Stunt 29 40" B 5.98
Kenki Panther 48" B-C 6.98
Kenki Wildcat 37" A-B 4.48
Kenki Bobcat 37" A-B 4.98
Kenki Cougar 51" B-C 6.98
Kenki Mustang 48" B-C 6.95
Key 29" B-C 5.98
Live-Dat 18" AA-A 2.98
Knocked 18" AA 2.50
Lil' Duper Zitch 42" A-B 3.95
Little Ace 18" AA-A 2.98
Little Bee 16" AA-A 1.98
Little Dart 18" AA-A 1.80
Little Mercury 18" AA 1.80
Little Mustang 18" AA 1.98
Little Sebro 18" AA 1.98
Lockheed Starfire 23" Jetex 2.49
MPC-7 39" B 5.98
ME 109 Jr. (P.D.D.) 20" AA 1.80
Minnow 28" A-B-C 5.95
Mini-Zitch 19" AA 2.95
Monocoupe 36" B-C 4.98
Monocoupe 90A 47" AA 4.98
Mr. Madison 32" B-C (Sterling) 9.95
Mustang 37" A-B (Berkeley) 5.95
Mustang (Sterling) B-C 36" 7.95
Mustang (Veco) 48" B-C 7.95
Mustang Jr. (P.D.D.) 20" AA 1.50
Mustang Sportsman (17½") AA-A 1.95
Mustang (Monarch) 20" AA-A 2.95
N.A. P51 16" AA 2.98
No. Amer. AT6 (SNJ) 31" A-B-C 4.95
No. Amer. AT6 18" AA 1.98
Orbit A Saro 70" B-C 6.98
Pagoosa 32" A 3.98
Peter Pan 16" AA 1.50
Piper Cub 22" AA 2.98
Piper Cub 35½" A-B-C 4.98
Piper Vagabond 36" A-B-C 3.95
Pitts Special 25" A-B 4.98
Polish Fighter 36" B-C-D 4.98
Primer 18" AA 1.40
PT Trainer 25" A-B 4.98
Puddin Jumper 19" AA 2.98
Quest 30" B 4.98
Redskin 31" A-B 4.98
Ringmaster 48" B-C 6.98
Ryan ST3 36" B-C 5.95
Ryan ST3 44 A 17½" 2.50
Scientific 2 in 1 Kit 18" AA 2.50
Scout 24" AA 2.50
Senior 5 17" 1.40
Senior 5 14" AA 2.98
Senior 5 32" B-C-D 5.95
Senior 9 27" 3.48
Senior 19 34" 3.98
Senior 29 39" 5.98
Senior Puddlejumper 25" A-B 1.95
Sky Scout 18" AA 1.98
Smoothie 35" A-B-C 4.98
Skyleader 18" AA-A 2.50
Slick Trick 18" AA-A 2.98
Small Fry 17" AA-A 2.50
Smoothie 50" A-B 7.98
Space Master 36" AA-A 2.50
Speedster 12" AA 1.50
Spitfire 20" AA 1.98
Spitfire Jr. 20" AA 1.80
Spitfire 18" AA 2.98
Sportsman Racer 18" AA 2.50
Sportwing 36" A-B-C 3.95
Stinger 36" A-B-C 3.95
Stinger 48" B-C-D 6.50
Stinson 22" AA 1.98
Stratosphere 60" B 7.95
Super Clown 28" B-C 2.98
Super Duper Zitch 52" C-D 8.95
Super Knock-Out 34" A-B 2.50
Super Squirt 21" (Jet) 9.95
Super Stunt Rent 20" 2.50
Super Zenith 25" A 3.50
Super Zipster 18" AA-A 2.98
TDI 24" AA 2.98
T-28 N.A. Trainer 30" B-C 5.95
Texan 18" AA-A 2.98
Thunderbolt 40" C-D 4.98
Trail Blazer 24" A-B-C 2.98
Trainer Prof. Trainer 32" A-B 2.50
Tritter Profile 32" A-B 2.50
Tritter Profile 38" B-C 4.98
Typhoon 17" AA 2.98
Vampire 40" B-C 4.50
Viking 51" C-D 8.75
Visan 21" AA 1.98
Wasp 33" B-C 5.98
Weco Cabin 12" AA 1.50
Warhawk 17" AA-A 1.98
Warhawk 32½" B-C 8.98
Warhawk Jerk 48" A-B-C 4.98
Warrior 36" A-B-C 4.98
Wee Duper Zitch 34" AA 2.98
Wee Willie 18" AA-A 1.98
Whirlaway 11" AA 2.98
Wing Dina 18" AA-A-B 2.25
Wing Dingo 16" AA 2.25
Yak (P.D.D.) 38" B-C 2.98
Yak Jr. (P.D.D.) 20" AA 1.50
Yak (Sterling) A-B-C 2.98
Yank 23" AA 2.50
Zenith 19" AA-A 2.50
Zipper 18" AA 2.98
Zero, Jr. 20" AA-A 1.80

ENGINES

GLO ENGINES

Atwood 049 (UC) ..... (AA) 4.50
Atwood 049 (FF) ..... (AA) 4.75
Atwood 061 ..... (AA) 5.50
Atwood Cadet ..... (AA) 3.95
Cameron Ring ..... (A) 9.95
Cameron Stepped ..... (A) 9.95
Cameron .19 two speed ..... (A) 11.95
Cameron .09 Marine ..... (AA) 11.95
Cameron .09 Marine Diesel ..... (A) 14.95
Forster P-29 Glo ..... (B) 11.20
Forster P-31 Glo ..... (B) 11.20
Fox .19 ..... (A) 12.50
Fox 29 ..... (B) 14.95
Fox 35 ..... (C) 14.95
Fox 59 ..... (D) 22.50
Hunt Torpedo ..... (AA) 9.95
K & B Glo Torp 29 ..... (B) 15.95
K & B Glo Torp 32 ..... (C) 15.95
K & B Torpedo 19 ..... (A) 13.95
K & B .15 (2-speed) ..... (A) 11.95
K & B 19 (2-speed) ..... (A) 16.95
K & B Torpedo 23 ..... (B) 13.95
K & B Torpedo 19 ..... (A) 10.95
K & B Torpedo .09 ..... (AA) 7.95
McCoy 9 ..... (A) 7.95
McCoy 19 Sport ..... (A) 9.95
McCoy 19 R.H. ..... (A) 10.95
McCoy 29 Sport ..... (B) 11.95
McCoy 29 R.H. ..... (B) 14.95

LOOK! Only AHC Gives You All These Terrific EXTRAS

1. One year subscriptions to Model Airplane News, Air Trails and Flying Models or their equivalent value to our regular customers.
2. 14-Day Money Back guarantee on unused purchases.
3. Sensational BONUS with every gas engine purchased! 50 ITEMS WORTH OVER $7.00 FREE OF EXTRA COST. See box below.
4. BONUS with gas planes! 12 ITEMS WORTH $3.50 FREE OF EXTRA COST. See box below.
5. No postage or packing charges for orders of over $1.00 (include 25c if order is under $1.00). We insure safe delivery ANYWHERE IN THE WORLD. Outside of U.S.A. (except APO & FPO) add 10%, for postage (minimum 50c).
6. Membership in "Modelcrafters of America," the club that keeps you up to date on gas modeling and SAVES YOU MONEY ON YOUR PURCHASES. Over 100,000 members!
7. No "minimum" orders. Any order is welcome.
8. 24-hour service. Mail addresses in Chicago, San Francisco, Denver and New Orleans airmail your orders to our N. Y. office for immediate shipment to you.
9. Most complete model stock in America—gas, rubber, radio, etc. If it's advertised, we can usually supply it.
10. Competent understanding of your modeling problems.
11. 128-page giant 2-color illustrated catalog FREE with every order.

SATISFACTION GUARANTEED OR YOUR MONEY BACK

JET ENGINES

Dyne-Jet Redhead 35.00
Mee 307 ..... 11.50
Jetex 50 ..... 9.95
Jetex 50 Contest Spl. 2.95
Jetex 100 ..... 4.95
Jetex Scorpion 600 ..... 6.95

ELECTRIC MOTORS

Dynamite 1.98
Speed Reduction Unit ..... .98
Usmas Electric Drive Unit 4.50
Outboard 4.95
A.M.C. 2.50
Super Dyna 2.50

RADIO CONTROL

Super Aerotrol "Ready to Operate" Includes Transmitter, Antenna, Escapement, Motor, Tubes. Everything to operate & maintain except batteries 49.95
Aerotrol Manual 1.00
Aerotrol Kit 31.95
Aerotrol Escapement Kit 2.95
Super Aerotrol Receiver Kit 13.95
Super Aerotrol Rec. Assb'ld 22.95
Super Aerotrol Transmitter Kit 19.95
Super Aerotrol Trans. Assb'ld 27.95
Super Aerotrol Escapement 2.95
Citizenship Receiver 22.95 & 29.95
Citizenship Transmitter 34.95

ACCESSORIES

PROPELLERS

Tornado:
5" D 2-3-4-5-6-7-8 P ..... .15
6" D 2-3-4-5-6-7-8 P ..... .15
7" D 2-3-4-5-6-7-8 P ..... .20
8" D 2-3-4-5-6-8 P ..... .25
9" D 2-3-4-5-6-7 P ..... .25
10" D 2-3-4-5-6 P ..... .30
Seamaster Plastic 9½"– 3in., 6"- 4p. .25; 9"- 4p., 4R 10"- 3bp., 11"- 3in., .50
Kavaan plastic 5/3, 5½/4, 6/3, 6/4, 6/5 –11c; 7/4 ..... .20
Top Flite 7"- 3in. in 3,4,5p—20c; 9"- in 4-6p- 8"- in 3½,4,5,6,10p; 9"- in 4-6,8,12in; 10"- in 3½,4,6,8,10in; 11"- in 4,6,8,10, 12in; 12"- in 5,8p; 13"- 5½p; 14"- 6p—25c.
PlasTorque, Power, Super Special, Veco, Testors, Berkeley.

METAL GAS TANKS

Dale Stunt Tanks—All Sizes ..... .65
Pressure— 1½oz/3oz ..... 2"—¾in/1¼in/1¾
1oz/2oz ..... 2"—¾in/1¼in/1¾in
2oz/3oz ..... 2"—¾in/1¼in/1¾in
3oz/4oz ..... 2"—¾in/1¾
2"—2½in/3in/4in
Fuel Tubing 1/16", 3/32", 1/8" ..... .10
Copper Tubing 16" OD, per ft. ..... .20
Finger Guard ..... .25
Brass Tubing (pt. or ½ pt.) ..... .50
Pylon Nylon Pump ..... .69
Pylon Fuel Bulb Pump 2 oz. 4 oz. ..... .69
Handy Boy Fuel Dispenser 1.25
Pylon Drain Valve ..... .25
Pylon Engine Starter 1.95; 2.50
Metal Motor Mounts, Sm. ..... .50
Large ..... .50
Black Neoprene Tubing, per foot ..... .10
Transparent Tubing, per foot ..... .10
Spitfire Timer 1.98
Austin Fuel-off Timer 1.95
Hillcrest Fuel Shutoff 1.25
D.E. Shutoff Valve 1.25
Sm. 70; Lg. 1.25—25c—joint ..... .50
Plastic Fuselage 19" set of 2 ..... .50
Prop Wrench, Reed ..... .25
Fiberglas 6"x12" ..... .35
1/16"—25c; ⅛"—30c; ¼" ..... .35
Silk, per yard ..... .25
Nylon (White or Yellow) yd. ..... .25
Socket Plug Wrench, 4-pc. 1.98
Flexible Needle Valves: Cobb Royal Spitfire, Spitty—49c; Veco, Baby Spit, Infant, Torp, Mini-Torp—39c; Universal Needle Valve (A-B-C engines) ..... .89
Nylon Flexible ..... .89
Needle Valve Extension Flexible ..... .29
McCoy Speed Needle Valve ..... .50
Vibrator 2.98
E-Z Running Stand 1.75
E-Z Minimount (½A) 1.25
Engine Support (AA) ..... .65
Sandpaper Packs ..... .10 & .20
Wire Bit ..... .10
Landing Gear Spade Bolts ..... .15
Landing Gear J Bolts ..... .25
Bolts ½"- 3 in. ..... 1½"- 2 in. 12/.25
Grant's Model Airplane Design 3.75
¾" A.M.A. Decals ..... .10
Scoremaster Decals (100) ..... .15
Small Parts Case ..... .50
Aerocapitan Plastic Balsa Tube ..... .25
4 oz. ..... .50
Rubbing Compound ..... .40
Aerogloss Wax ..... .40
Aerolustre Rubbing Compound ..... .40
Sandpaper ..... .10

MODEL RAILROADERS!

Did you know that AHC now carries a complete line of HO GAUGE RAILROAD EQUIPMENT? Send 25c for catalog.

ACCESSORIES

Condenser 20; Smith Metal ..... .25
O & R Instant Clip ..... .10
Alligator ..... .10
O.K. Coil ..... 2.50 Rovers Coil 2.00
O.K. Twin Coil .4.00 Wilco Coil 1.95
Smith Firecracker Coil 2.75
1½ Volt Battery ..... .90
Cox Cord Kit ..... .40

PROP SPINNERS

1½"—70c; 1½"—90c; 2" 1.00
Plastic 1½"- 1¾"- 2" ..... .50
Plastic 1½"- 1¾"- 2" ..... .45
Aloe Chrome, Austin.

WHEELS

K&B Alum. Hub: 1"—30c; 1½"—40c; 2"—50c; 2½" ..... .60
Semi-Scale (pr) 2" 1.29
2½"—1.40; 3"—1.75
Sponge Rubber (pr) ½"-1" 30c 1½"-2" 40c 2½"-3" 50c ..... .85
Tail Wheels 1"- ⅝"- 1" ..... .40
Treaded Plastic (pr) 1½" or 1¾" ..... .98
1⅝"- 2" 50c; 2½"- 3" 60c 1.40
Nylon (pr) 1"- 1.00; 1.25; 1.50
Wheel Collars ..... pr. .15

MISCELLANEOUS

Glo Engine Handbook 1.00
Spitfire Glo Plug Clip ..... .15
Batt. Box Pen. Medium, Regular ..... .40
Pylon Tubing 1/16", 3/32", ⅛" ..... .10
Copper Tubing ⅛" OD, per ft. ..... .20
Finger Guard ..... .25
Brass Tubing (pt. or ½ pt.) ..... .50
Pylon Nylon Pump ..... .69
Pylon Fuel Bulb Pump 2 oz. 4 oz. ..... .69
Handy Boy Fuel Dispenser 1.25
Presto Disc Starter ..... .25
Pylon Engine Starter 1.95; 2.50
Metal Motor Mounts, Sm. ..... .50
Large ..... .50
Black Neoprene Tubing, per foot ..... .10
Transparent Tubing, per foot ..... .10
Spitfire Timer 1.98
Austin Fuel-off Timer 1.95
Hillcrest Fuel Shutoff 1.25
D.E. Shutoff Valve 1.25
Sm. 70; Lg. 1.25—25c—joint ..... .50
Plastic Fuselage 19" set of 2 ..... .50
Prop Wrench, Reed ..... .25
Fiberglas 6"x12" ..... .35
1/16"—25c; ⅛"—30c; ¼" ..... .35
Silk, per yard ..... .25
Nylon (White or Yellow) yd. ..... .25
Socket Plug Wrench, 4-pc. 1.98
Flexible Needle Valves: Cobb Royal Spitfire, Spitty—49c; Veco, Baby Spit, Infant, Torp, Mini-Torp—39c; Universal Needle Valve (A-B-C engines) ..... .89
Nylon Flexible ..... .89
Needle Valve Extension Flexible ..... .29
McCoy Speed Needle Valve ..... .50
Vibrator 2.98
E-Z Running Stand 1.75
E-Z Minimount (½A) 1.25
Engine Support (AA) ..... .65
Sandpaper Packs ..... .10 & .20
Wire Bit ..... .10
Landing Gear Spade Bolts ..... .15
Landing Gear J Bolts ..... .25
Bolts ½"- 3 in. ..... 1½"- 2 in. 12/.25
Grant's Model Airplane Design 3.75
¾" A.M.A. Decals ..... .10
Scoremaster Decals (100) ..... .15
Small Parts Case ..... .50
Aerocapitan Plastic Balsa Tube ..... .25
4 oz. ..... .50
Rubbing Compound ..... .40
Aerogloss Wax ..... .40
Aerolustre Rubbing Compound ..... .40
Sandpaper ..... .10

MODEL RAILROADERS!

Did you know that AHC now carries a complete line of HO GAUGE RAILROAD EQUIPMENT? Send 25c for catalog.

DOPES (Cont'd U.S.A. Only)

We carry all lines of dope and cowl. Aerogloss, Comet, Monocoat, Testors, etc.

U-C ACCESSORIES

Adjustable Push Rod Set 8
BERKELEY control lines
.004 or .006x30 3
.006x3-52 3
.008, .010, .012; 3'-48 3
.008, .010, .012, .014 2'-70 3
.012, 5-16; 3'-96 3
Threaded .015, .021 85' 1.00; 70' 1.25; 200' 2.50
Berkeley Metal Flight Reel 1.5
Berkeley Metal Handle 1.5
Controliner Flight Reel (with wire) 2.95; 2.5
Elevator control horn: Veco..... .25 & .3
Elevator hinges 4 for 2
E-Z Plastic Control Handle 4
Flex Lead-in Wire AA or A3 2 ft. 2
Lazer Clips A, B, C or D Pr. 3
PYLON control lines
.008, .010, .012, .014, .016 dia. 2-52 lines 8
.010, .012, .014, .016, dia. 2-70 lines 3
Flexible 2-52' 1.50; 3-70' 1.5
Kenki Fretrod Keeper 2
Nylon Lines AA 2
Pylon Bellcrank 2"—.20; 3" 3
Pylon Conn. Clips A, B or C...3 for 2
Pylon Control Line Reel 1.2
Pylon Flex Lead-in Wire, 6 Pr. 3
Pylon Plastic Handle 4
Pylon T.D. Handle Reel & Handle 16A 1.9
T. D. Deluxe Reel & Handle 2.5
Stunt Bellcrank (6 Elev. Horn 2
Swivels, small, per pair; large 2
Handy Reel (Comet) 1.5
Handy Reel (Veco) 1.5
U-Ready Contr.—7.50; cable 3.9
Veco Bellcrank 2"—.25; 3" 3
Veco Control Handle 4

MODEL BOATS

Chris-Craft Challenger 33" C-D 9.9
Chris-Craft 28" C-D 6.9
Chris-Craft Runabout 22" BCD 4.9
Chris-Craft Runabout 25" BCD 6.9
Harco 25" B-C-D 6.9
Harco Tender 18" B-C-D 4.9
Vineyard 25" BCD 4.9
Hydro-Plane 17" A-B-C 4.9
Buckeye 13½" AA-A 1.9
Buckeye Cabin Jr. 13½" AA-A 1.9
CCC Riviera 12½" AA-A 1.9
CCC Riviera 12½" A-A-C 1.9
CCC Catalina 21½" A-B-C 1.9
CCC Outboard 12½" AA-A 1.9
CCC Special 12½" AA-A 1.9
Hydro Speedster 16" AA-A 1.9
Richardson Sedan 17" AA-A 1.9
Royal Skimmer (Incl. Engine) 10.9
Spitcraft (Fiberglas Hull) 1.9
Spitcraft (Plastic) 1.9
Sterling C.C. Jnr. 19" AA-A 1.9
C.C. Sea Cruiser 14" AA-A 1.9
Resorter 12" AA 1.9
Sea Maid 12" AA 1.9
Sea Maid 27" A-B 1.9
C.C. Ensign 15" AA 1.9
C.C. 21" Sportsman AA 1.9
Century Resorter 12" AA 1.9
Century Seamaid 12" AA 1.9
Cruiser 28" Radio Control A-B 1.9
Scientific Runabout 1.9
XP-300 Dream Boat 12" AA 1.9

RACE CARS

Automite with Wen Mac Engine 10.9
Automite 5.9
Midget 2.9
O & R Complete with Engine 16.9
Redcy Complete with Engine 16.9

SPECIAL BONUS OFFERS

36 items WORTH OVER $7.00 **FREE** of extra cost with every **GAS ENGINE**

(With Diesel or glo engines, all needed items are given.) Other bonus items included: Quality Coil — Condenser — Hi-Tension Wire — Stranded Ignition Wire — Insulated Coil Holder — Correct Size Prop — Presto Engine Starter — Fuel Tubing — Battery Box — Glow Switch — 24-Page Engine Manual — 4 Mounting Bolts — 4 Mounting Nuts — 4 Wiring Lugs — Spark or Glo Plug — Identification Tags — Master Timer — Speed Indicator — Log Book — Trouble Shooting Chart — No. 70 Oil — Membership in Modelcrafters of America — AHC Guarantee — 128-Page GIANT 2-Color Illustrated Catalog — Free Postage — Packing and Insurance if ordered by mail.

12 items WORTH OVER $3.50 **FREE** of extra charge with **GAS PLANES**

Correct-Size Rubber Wheels — Giant Construction Manual — Speed Indicator Log Book —Complete Full-Size Plans — Insignia — Membership in Modelcrafters of America — 128-Page GIANT 2-Color Illustrated Catalog — Free Postage — Packing and Insurance if ordered by mail.

(Bonuses on planes selling at over $1.50 only)

ORDER NOW! Get all these AHC "EXTRAS"

CONTROL SYSTEMS

O & R 23 Bx Deluxe ..... (B) 11.95
O & R 29 Glo ..... (B) 13.95
O & R 33 Glo ..... (C) 13.95
O & R 59 Marine ..... (B) 13.95
O & R 60 Glo ..... (D) 13.95
O.K. Cub Transmitter (complete) 17.95
O.K. Cub .099 Plug. ..... (A) 7.75
O.K. Cub .049X Plug. ..... (AA) 6.25
O.K. Cub .049 Plug. ..... (AA) 6.95
O.K. Cub .074 ..... (A) 8.95
O.K. Cub .074 Plug. ..... (A) 8.95
O.K. .15 ..... (A) 8.95
O.K. Hotbead Glo ..... (B) 14.95
Royal Baby Spitfire Plus. ..... (AA) 4.98
Royal Spitfire ..... (A) 7.95
Sal Fury 29 ..... (A) 9.95
Space Bug ..... (AA) 6.95
Space Bug Jr. .049 ..... (AA) 3.98
Triumph .49 or .51 ..... (C) 10.00
Thermal Hopper (FF) ..... (AA) 6.98
Vanis ..... (B) 14.95
Veco 31 ..... (C) 14.95
Veco (99) ..... (AA) 6.50
Wasp (U-C) ..... (AA) 6.50
Wen-Mac .049 Plug. ..... (AA) 6.95

DIESEL ENGINES

McCoy .049 ..... (AA) 8.95
McCoy .09 ..... (A) 7.95
O. K. Cub .078 ..... (A) 7.50
O. K. Cub .15 ..... (A) 9.50

IGNITION ENGINES

Dentymite ..... (C) 6.98
O & R 23 RV Deluxe ..... (B) 14.95
O & R 29 Rotary ..... (B) 14.95
O & R 33 ..... (C) 14.95
O & R 60 Lute ..... (D) 14.95
O.K. Hotbead (Sup 29) ..... (B) 12.95
Phantom P-30 ..... (C) 13.95
Rev-Up ..... (D) 14.95
Thor ..... (B) 9.98
Wasp Twin ..... (D) 29.50

CONTROL SYSTEMS

Citizenship Escapement 8.95
Control Master #27 Transmtr. 29.50
Control Master #9R3 Motor 19.95
Control Master #27RH Rec'vr. 19.95
Good Bros. Escapement 13.50
ECC Transmitter (complete) 17.95
ECC Transmitter 10.95
ECC Receiver 18.95
ECC Escapement 6.50
ECC 3A Relay 6.50
Twin Tube Rec'vr Kit 7.95
Tool Master (Citizenship) 19.95
Motor Control Unit 14.95
Ballcrank & Horn (RC) ..... .75
U-15 Battery Box ..... .50
No. 7 Battery Box 1 Cell ..... .20
No. 7 Battery Box 2 Cell ..... .40
No. 7 Battery Box 3 Cell ..... .60
No. 7 Battery Box 4 Cell ..... .75
3AB Transmitter Tube 2.25
3YGI Receiver Tube 2.25
Zero 3 Milliammeter 3.50
Zero 90 Milliammeter 2.75
Whip Antenna 3.00
Also All R.C. Parts and Batteries and anything advertised

IGNITION ACCESSORIES

6 ft. Hook-up wire ..... .25
Austin Booster Plug-in ..... .30
Midget Switch: slide—.25 Toggle ..... .50
O & R Snap Pack ..... .35

ENGINE TRADE-IN SERVICE

While America's Hobby Center, Inc. does not sell used ehgines, we have a constant request from schools, clubs and overseas soldiers for second-hand engines for experimental work. If you have a used engine, we will be glad to accept it in trade for any merchandise (motors, planes, boats, accessories, etc.) except Flying Outfits and a few other exceptions, listed in our ads or catalog. Just send in your engine (with your name and address) as the following schedule indicates:

Your old Engine PLUS				
	$3.75 = $5.00	11.25 = 15.00	Credit towards your Purchase
	7.50 = 10.00	15.00 = 20.00	
	22.50 = 30.00		

We will match any offer in this magazine. Just enclose their ad.

You will receive the usual free premiums, subscriptions, etc.

ENGINE PARTS! EVERY PART for EVERY ENGINE listed on these pages is IN STOCK at America's Hobby Center. Send today for the parts you need to keep your engine in flying condition.

HOW TO ORDER

Send payment in full. No stamps, no C.O.D.'s.

Address your order to us at the branch office nearest to you:

Dept. M-44 — 156 West 22nd St., New York 11, New York
Dept. M-44 — 1065 Broadway, Brooklyn 21, N. Y.
Dept. M-44 — 55 E. Washington St., Chicago 2, Illinois
Dept. M-44 — Room 230, 742 Market St., San Francisco 2, Cal.
Dept. M-44 — Room 306, 427 Carondelet St., New Orleans, La.
Dept. M-44 — 965 Gas & Electric Bldg., Denver 2, Colorado

Use convenient order form on Page 9

2 ENGINE BARGAINS

O. & R. .60 SIDEPORT ENGINE. Discontinued number. Regularly $16.50. Your choice of Ignition or Glo for only $6.98

ANDERSON SPITFIRE CLASS D .446 ENGINE. One of the most powerful engines. Regularly $24.98. Your choice of Ignition for $14.98 or Glo for $15.45.

And with engine, you can buy 6 matching 65c PROPS for $1.00

Both BRAND NEW and FULLY GUARANTEED

SPECIAL SOUVENIR BARGAIN

The manufacturer of a well-known engine, after selling 30,000 at $9.95 has decided to go out of production. We made a special purchase of his remaining 1,000 complete sets of finished and unfinished CASTINGS and PARTS: cylinder, piston, piston pin, connecting rod, needle valve, gas line, timer, crank shaft, crank case, cam, etc., including screws, gaskets, nuts, etc.

You get a complete set, except spark plug and tank. An interesting souvenir of a model engine in the raw for your den or desk.

No. .19 . . . $1.00 per COMPLETE SET

SPECIAL BARGAIN IN PROPELLERS

15 ASSORTED FOR $1.00

We have purchased 50,000 assorted GAS MODEL PROPELLERS from the country's largest prop manufacturer.

They are all PERFECT and range from Champion semi-finished (listing at 5 for $1.00) to finished and lacquered props that sell up to 40c each regularly. Various pitches, in sizes from 7" to 14".

No selections, please, but we will send you a fine assortment of 15 for $1.00. If accompanied by an order for anything advertised in this magazine. MONEY BACK GUARANTEE.

WE DUPLICATE ANY OFFER

made by any other advertiser. Attach ANY ad to your order—and take advantage of the AHC "extras."

USE THIS ENTIRE MAGAZINE AS OUR CATALOG . . . EVERYTHING IN THE MAGAZINE CAN BE ORDERED FROM AHC.

WE ALSO SELL TO DEALERS

Did you know that Mod-Ad Agency, Inc., the wholesale affiliate of America's Hobby Center, Inc., is one of the fastest growing jobbers in the business?

We know your problems because we have your problems! Write for sample catalog (ready for your imprint) and our famous 9-point program—the reasons why more dealers are doing business with us. Includes our 60-day return privilege, etc. Special data if you are going into business. We ship anywhere in the world.

Write to MOD-AD AGENCY, Inc. 156 West 22nd Street, New York 11, N. Y. or 1067 Broadway, Brooklyn 21, N. Y.

Branches Coast-To-Coast

AMERICA'S HOBBY CENTER, Inc.

1931 **23rd YEAR** 1954

America's Largest Source of Models & Supplies

4 STAR GUARANTEE

★ To give complete satisfaction or your money refunded ★ To save you money
★ To insure safe delivery anywhere in the world ★ To deliver what we advertise

COMPLETE FLYING OUTFITS

Worth Twice Our Combination Price!

Man . . . what a buy! Imagine—you get a COMPLETE FLYING OUTFIT at less than half price. That's right, a U-Control PLANE plus your choice of a well-known factory assembled Ignition or Glo ENGINE plus ALL ACCESSORIES plus all the BONUS "extras" listed below. Here's everything you need, complete with easy-to-follow full size plans and instructions, in one purchase that SAVES YOU FROM $10 to $12. Thousands of hobbyists have already taken advantage of these sensational values. Choose yours NOW!

Believe it or not! 2 COMPLETE PLANES Make and fly BOTH these 18" profile models

F-86 SABRE PLUS F-51 MUSTANG

PLUS ACCESSORIES AND BONUS EXTRAS

PLUS SPACE BUG JR., .049

BIG $10 OUTFIT FOR ONLY $5.49

With O.K. Cub .049 – $6.39

YOU NAME IT — WE SUPPLY IT!

MAKE UP YOUR OWN FLYING OUTFIT if you wish! Name your own combination of ANY ENGINE AND PLANE listed on the opposite page or advertised ANYWHERE in this magazine. We'll supply it and throw in our SPECIAL BONUS items at no extra cost. Just order from us or write for price.

SPECIAL BONUS OFFER

50 items WORTH OVER $10.00 FREE of extra cost with every complete flying outfit at plane and engine.

Correct Size Finished Propeller — Presto Engine Starter — Speed Indicator Tables — Log Book — Motor Cover — Spark or Glo Plug with Gasket — Complete Engine Instructions — Genuine Engine Handbook — Engine Adjustment Chart — Metal Fuel Tank and Gas Line — Metal Battery Box — Wilco Quality Coil — 12" Hi-Tension Lead Wire and End Clips — 18" Insulated Ignition Wire — Ignition Slide Switch — Coil Holder and Mount — Everlast Condenser — SAE 20 Oil — 4 Ignition Wiring Lugs — 2 Plane Identification Tags — 72 Insignias — Giant Book on Control-Liners — How to Build and Fly Them — Cement — Sandpaper — Metal Bellcrank with Bolt, Nut and Washer — Elevator Horn — Elevator Hinges — Lead-In Wire — Push-Rod Wire — U-Control Handle — 100 ft. U-Control Stainless Steel Wire and Reel — Membership in Modelcrafters of America — 128-page 2-color Catalog — Postage — Packing — Insurance — Ignition parts not needed with glo-engines not included.

NOTE! You may substitute any plane or engine of equal value for any plane or engine included in these offers. Take your choice from listings on opposite page.

DELUXE BARGAIN COMBO

Your choice of

Scientific's 16" and 18" wingspan control-line models. Extra de-luxe kits PERFECTLY and COMPLETELY PREFABRICATED. Beautiful models you will be proud to fly. A cinch to build in only one evening.

PLUS ROYAL SPITFIRE .065

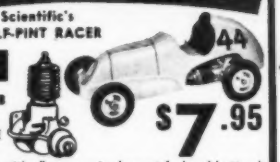
Most powerful ½ 2A engine

PLUS ACCESSORIES AND BONUS EXTRAS

$15 VALUE FOR ONLY $9.95

SAVE on This POWERED RACE CAR COMBO

Scientific's HALF-PINT RACER



PLUS O.K. CUB .049 ENGINE

$7.95

Complete with all accessories (except fuel and battery). Features direct wheel drive. Five minutes after you open the package you can race this car at over 40 m.p.h. on any smooth surface.

ORDER NOW! Get all these AHC "EXTRAS"

AHC SPEEDBOAT SPECIAL

Chris-Craft Riviera RUNABOUT

Your CHOICE of the SCIENTIFIC 12" model (featuring one-pc. carved balsa hull) or BERKELEY'S 12" model (pre-fabricated parts) . . . both terrific Speed-boat "thrillers".

PLUS O.K. CUB .049 ENGINE or ELECTRIC MOTOR

PLUS Every accessory you need, including: all metal parts—flywheel and propeller, drive shaft, etc. PLUS 15 bonus "EXTRAS" at no extra cost!

SCIENTIFIC RIVIERA with Cub .049 $8.50 / with Electric Motor $4.95

BERKELEY RIVIERA with Cub .049 $7.95 / with Electric Motor $4.50

BIG $10 Value Only $7.50

Your choice of one of these prefabricated Scientific 22" span U-Control planes:

PLUS ATWOOD .049 OR PLUS O.K. CUB .049

ALL ACCESSORIES AND BONUS EXTRAS

BIG SAVINGS on AHC's Famous 5 ACES OUTFIT

Your choice of any of these Scientific prefabbed 22" U-C planes: AERONCA SEDAN, CESSNA, PIPER CUB, STINSON (Illustrated elsewhere on this page)

PLUS SPACE BUG JR., .049 $5.33 or CUB .049 ENGINE $5.95

PLUS ACCESSORIES AND BONUS EXTRAS A $10.00 VALUE

SAVE 33-51%

SPECIAL PURCHASE - DISCONTINUED MODELS FAMOUS FREE FLIGHT PLANES

We have a limited supply of these "closeout-special" Consolidated models . . . all bargain priced. At these prices they'll go fast. RUSH YOUR ORDER!

DIAMOND DEMON 40" B. Req. $2.95 — 1.50	JERSEY JAVELIN 40" B. Req. $3.95 — 1.95	PACER C 60"C Req. $6.95 — 3.50
ROAMER 45" A-B Req. $2.95 — 1.95	ROCKETEER 40" A-B Req. $3.95 — 1.95	STRATOS 42" A Req. $2.95 — 1.95
ZIPPER 32" A Req. $2.50 — 1.95	All models in A-1 condition . . . guaranteed by AHC's famous money-back guarantee.	

DECAL BARGAIN

$1.00

Just look what you get: 1-3/8" AMA decals, 62 black decals (2 complete sets of numbers plus alphabet and extra letters), 1 set of 4 star & bar 2", 6 picture decals 2" x 4", 3 sheets of solid colors, 1 sheet checkerboard decals, 6 strips of solid color, plus Tips and Hints on use of decals. A REAL BARGAIN . . . WORTH MANY $$$.

$1.00

SUPER SPECIAL FLYING OUTFITS!

TRAIL BLAZER

You'll love this beauty with carved lower fuselage-half, fully formed aluminum upper half, balsa sheet wing (no tissue used), balsa tail surfaces, plywood engine mount, rubber wheels. Comes with schematic drawings with step-by-step plans, detail paint schemes. 24" Wingspan.

PLUS CHOOSE ONE $12.50

YOUR CHOICE OF ANY OF THESE ENGINES:

McCoy .19 Glo — Thar Ignition — Cameron .19 Glo

READY-TO-FLY-PLANES

AEROMITE $9.95

A really beautiful red plastic job. 17" wingspan with AA Glo Engine. Prop Spinner, Tank, etc. already installed. Shock-absorbing spring-steel cabin and stout flying, plastic Control Handle. Nylon Control Cord.

A J FIREBABY $7.85

You can't beat this beautifully finished and painted "baby"—she's even fuel-proofed. 19" wingspan. Includes new "slow-motion" propeller and engine.

A J FIREBABY BIPLANE $9.75

It's a terrific stunt ship—this biplane version of the famous FIREBABY. 19" span. Painted and fuel-proofed. Complete with Supercharged Royal Spitfire engine.

Thimble Drome TD-1 $19.95

Of course you've heard of it. This completely assembled deluxe model features an all aluminum wing (24" span). Comes complete - ready to fly - with Space Bug engine, control rod, battery wires, control lines, etc., etc.

TURN PAGE FOR MORE AHC SUPER BARGAINS AND HANDY ORDER FORM ➡

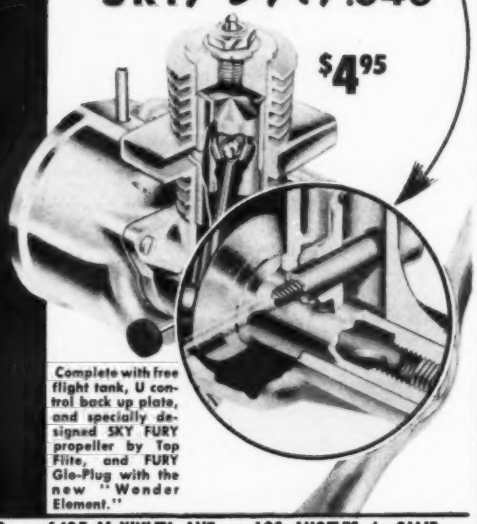
No. 2 in a series of INSIDE FACTS.. ..Allyn's SKY FURY .049

SHAFT ROTARY VALVE & MAIN BEARING

The SKY FURY is so designed that placement of the down-draft carburetor permits greater bearing area between rotary valve port and crank webb. This feature, in combination with the high surface finish required by our standards, assures a more durable and freer running bearing to give your engine longer life and many additional hours of flying pleasure.

See next month's issue for the third in a series of INSIDE FACTS about the SKY FURY.

$4.95



Complete with free flight tank, U control back up plate, and specially designed SKY FURY propeller by Top Flite, and FURY Glo-Plug with the new "Wonder Element."

Allyn SALES CO., INC. • 6425 McKINLEY AVE. • LOS ANGELES 1, CALIF.

HOLLAND Wasp ACCESSORIES

AT YOUR DEALER

HOTTEST EVER!

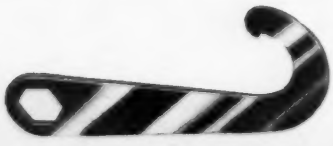
Class A & B

Class ⅜A

Adapter plates available to fit most popular makes of engines.

It's for you! A 3 for 1 bargain unit! Micro tank, timer and engine mount at the cost of most tanks only. Start and adjust engine with full tank—release valve lock and engine runs out only predetermined amount of fuel in timing cell.
For .049 and similar engines, **$1.50**
For .19 to .33 engines **$1.75**

Clip seconds off your starting time with HOLLAND Instant-Action GLOW PLUG CLIP. One hand does the trick when you use the Holland Glow Plug Clip. Clip it on—snap it off—you're on the air! . . **15¢**



NEW! HOLLAND HANDY WRENCH Two-ended wrench for loosening or tightening glow plugs and removing cylinders—without damage. Accurately engineered to fit most engines. Keep one handy in your tool box! . . . **25¢**

HOLLAND ENGINEERING CO., El Monte, Calif.

When a guy like Gilliam says he hasn't seen anything like it, it has to be good. Imagine, a model builder raving about another man's design!

Al Grenoble and Frank Hauser picked up our remarks about a fellow who got mad at the Nationals because he won a big trophy. Unlike the Wakefield, Nordic, et al, some of these trophies are a two man carrying job. The boys thought we referred to Bill White, Jr., because the National Championship Trophy wouldn't fit in the car along with three other modelers and luggage in a drive through to the Coast. Heck, no, fellows, not Bill! Never a boy more thrilled, humble and appreciative, they tell us. Anyway, our man lived four-figure miles away.

* * *

▸ Lunch, hosted by Bill Effinger at the Wings Club in New York, with Lieut. Cmdrs. Howard Eddy and Richard D. Lazenby, who replaced Howard in Office of Information, Department of the Navy. To carrier event entrants who remember Lieut. Cmdr. John Burton, who know Eddy, and who will be meeting Lazenby at contests this year, the Navy's selection of these fine officers as their representative among us speaks well of their high esteem of us modelers. The Navy doesn't forget that 90 per cent of its naval aviators once built model airplanes . . . By the way, model plane building now ranks as the No. 1 U.S. hobby.

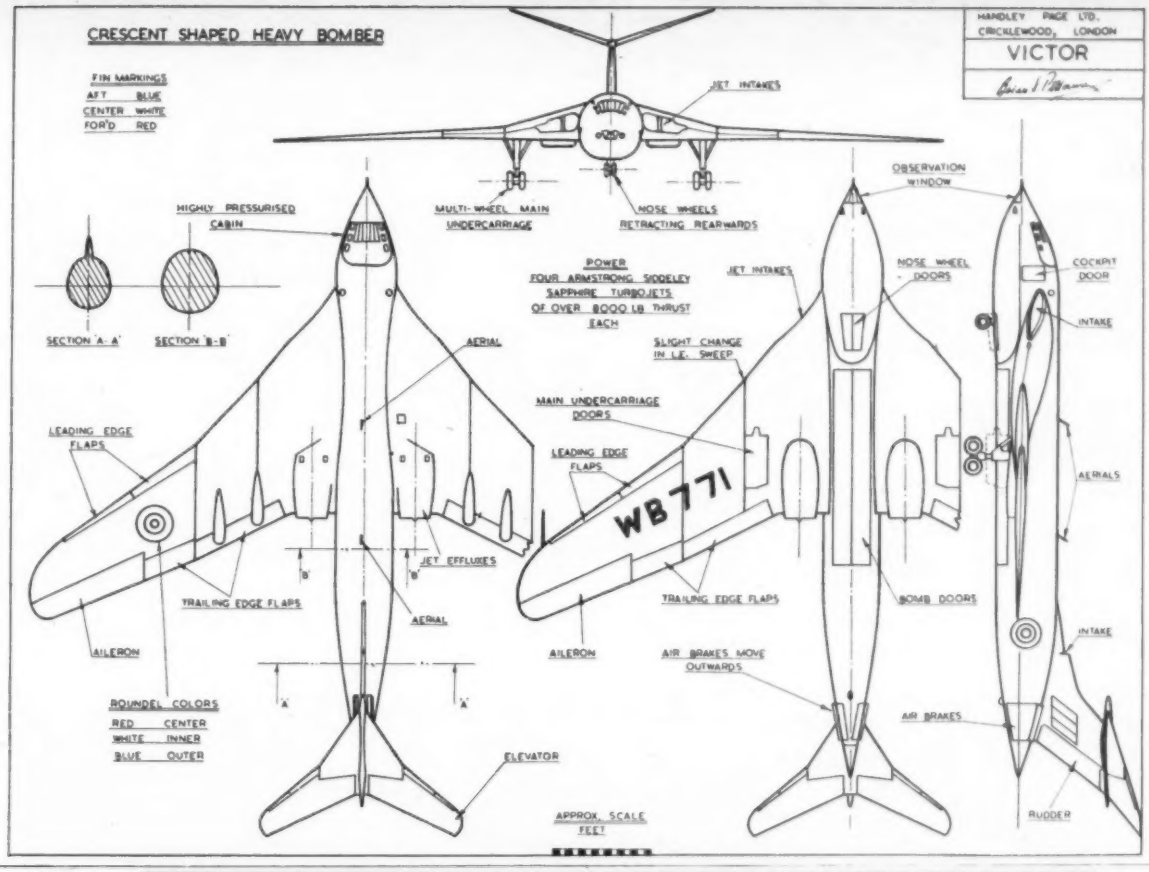
* * *

▸ The Plymouth program is no more. But PAL clubs will be carried on, through the AMA. So the arguments are over. It was amazing. The biggest outside influence on American modeling in recent years, promotions that cost thousands of dollars and, in fact, must have totaled a million for the finals at Detroit alone. Now it is gone . . . Speaking of contests, one of the finest for its excellent results is held each year in Cleveland, Ohio. The Seventh Annual Model Plane Exhibit, sponsored jointly by the Air Foundation and the Cleveland Chamber of Commerce as a tribute to the Cleveland Community Chest, is for all the kids of the city. Over 2,000 entrants last year. Initially designed for the children of the 122 Red Feather agencies—scouts, Salvation Army, psychiatric treatment centers, the Y's, and similar groups—it is truly city-wide with national implications. They say so! Age groups for first and second grades, and so on, up through school to the eleventh and twelfth grades and Open Class, for solid and built-up scale, futuristic scale, craftsmanship. Monday, Tuesday, February 22-23, Higbee Co. auditorium . . . Salt Flat Sentinel, new club paper by the Ute Aeromodelers, of Salt Lake City, Utah. It's 50¢ a year. Write Dave Taft, 1205 E. Kensington Ave., Salt Lake City. Lots of good info—note one question: What has happened to the Plymouth Meets in Utah? Sound familiar?

* * *

▸ Tom Pearson, Chicago U-Liners, dares us to publish this (thinks speed men are too thin skinned). Seems a Dynajet powered boat hit a wave and became airborne. It flew three laps at 45 mph with the hull at a 45° angle! The U-Liners have swell meetings, lots of well presented stuff, and flying site for all kinds of models except rubber and jet. RC okay. Meet at 14510 Union, Ivanhoe, Ill., second Wednesday, monthly (Tom Pearson, 245 E. 150 St., Harvey, Ill.) . . . Quincy, Ill., again active: new club, Quincy Hawks Model Airplane Club, c/o Charlotte Daebelliehn, 2020 Ohio, Quincy. Free flight and U-control. Planned meetings interesting, realistic program . . . Quickening interest in indoors and no foolin'. Ferenstance—Micro Filmsies, an indoor model club, probably the nation's first, Emanuel Radoff, 276 Schley St., Newark, N. J.; will correspond with indoor fans and

(*Continued on page* 39)



EVERYTHING *anywhere in this magazine can be ordered from AHC*

ORDER NOW!

Copyright 1953 America's Hobby Center, Inc.

N. Y. City MODELERS
Two Stores to Serve You

Largest stock in the country at either of our two stores . . .

Experts on hand to help you with your problems. Complete stock including engine parts and service.

156 WEST 22nd STREET NEW YORK CITY

1065 BROADWAY BROOKLYN, N. Y.

SOLDIERS! SAILORS! MARINES!

Orders placed through us get special attention. We understand your problems and take special care of your orders. No postage or packing charges on orders for over $1.00.

CANADIANS & FOREIGN MODELERS!

You save plenty by ordering from us. We accept your currency at market value. Add 10% for postage and packing (minimum 50¢).

HOW TO ORDER

Send payment in full. No stamps, no C.O.D.'s. Address your order to your nearest AHC branch office. Include 25¢ extra if order is under $1.00.

AMERICA'S HOBBY CENTER INC.

Please RUSH me the following: **DEPT. M-44**
PLEASE PRINT

156 West 22nd St., New York 11, New York
1065 Broadway, Brooklyn 21, N. Y.
55 E. Washington Street, Chicago 2, Illinois
Rm. 230, 742 Market St., San Francisco 2, California
Rm. 306, 427 Carondelet St., New Orleans, La.
965 Gas & Electric Bldg., Denver 2, Colorado

Name _____

Street Address _____ Amount Enclosed _____

City _____ Zone _____ State _____

Page	Quantity	Name & Description of Items	Cost Each	Total
	ONE ONE ONE	ENGINE TROUBLE TRACER & AID MANUAL SPEED INDICATOR CHARTS FLIGHT LOG BOOK	**FREE** with each order	
			Total	

24 HOUR SERVICE AT ALL TIMES

ONLY **25¢** EACH

- ☐ WORKBENCH EDITIONS of the famous Winston books (Reg. $1.00 each) for only 25¢ ea.
- ☐ GLO ENGINE HANDBOOK. Tells all about the theory and operation of glo engines.
- ☐ CONTROL LINERS. How to build and fly them. Covers subject from A to Z.
- ☐ GAS MODEL PLANE CONSTRUCTION. The answers to every problem you will ever meet.

24 HOUR SERVICE

SAVE TIME!
USE THIS HANDY ORDER FORM

Branch offices conveniently located coast-to-coast. airmail your orders to our N. Y. headquarters for immediate shipment.

GUARANTEED
Safe Delivery Anywhere in the WORLD

FREE AHC "BARGAIN BULLETIN"

Lists dozens of big bargains. Send a self-addressed, stamped envelope today for your FREE copy.

DELUXE HOBBY CATALOGS

25¢ 128 page 2-color 9" x 6" catalog, fully illustrated. Over 10,000 items, including gas, glo, diesel, and jet engines, rubber powered planes, boats, cars, solids of all kinds, tools, engine parts, etc., etc.

10¢ 64 page 2-color 9" x 6" illustrated catalog. Free flight and U-Control planes, engines, accessories, rubber powered planes, solids, boats, cars. Over 5000 items.

FREE Fine jumbo catalog of thousands of hobby items: Plane, boat, car, engines, accessories, solids, gas, rubber, etc., etc.

the challenge of

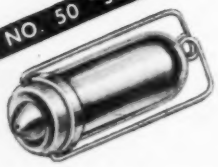
JET POWERED FLIGHT

Clean design, careful construction and skilled workmanship . . . these are the pride of the accomplished modeller. And it is these characteristics that pay such enjoyable dividends to users of Jetex engines. For the basic fact of jet power is this: *Efficiency is proportional to speed.* Thus minimum air resistance and weight of a model take the greatest advantage of the 800 m.p.h. thrust of a Jetex engine.

That is the challenge . . . to build models which combine strength, streamlining and low weight . . . to achieve maximum performance. Meet the challenge and you will be rewarded by thrilling performance and the enjoyment which only jet powered flight can offer.

JETEX JET ENGINES

JETEX NO. 50 "STANDARD"



The world's smallest jet engine, most popular in the line; it is adaptable to practically any small model on the market. Price, complete with fuel, wick, instructions. $1.95

JETEX NO. 50B "Contest Special"—a sturdier version of the No. 50 "Standard", designed specifically for use with an augmenter tube.
Price, with fuel, wick, instructions, and 6-INCH AUGMENTER TUBE $2.95

JETEX No. 50 fuel—6 pellets with wick and spare washers ..... $ .50
15 pellets with wick and spare washers $1.00

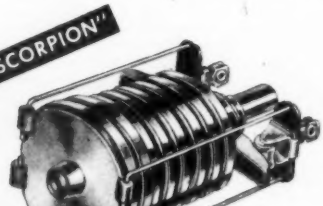
JETEX NO. 150 "JETMASTER"

Its streamlined proportions make this the ideal engine for average-size scale models of jet fighter planes. The 12-inch augmenter tube, available separately, may be used as a structural member of such models.

Price, complete with fuel, wick, instructions $4.95
12-inch augmenter tube for "Jetmaster" (may also be used with the No. 600 "Scorpion") ..... $ .95
JETEX No. 150 "Red Spot" fuel—10 pellets with wick and spare washers ..... $ .95

JETEX JET ENGINES				
SPECIFICATIONS	#50	#50B	#150	#600
ENGINE WEIGHT	.2oz.	.2oz.	.73oz.	1.6oz.
FUEL WEIGHT	.2oz.	.2oz.	.27oz.	.4oz.
TOTAL WEIGHT	.4oz.	.4oz.	1.00oz.	2.0oz.
THRUST (average)	.6oz.	.6oz.	1.75oz.	5.5oz.
THRUST with Aug. Tube	-----	.75oz.	2.25oz.	7.0oz.
THRUST duration	12 sec.	12 sec.	14 sec.	10 sec.
JET EXHAUST VELOCITY	1200⅝	1300⅝	1400⅝	1600⅝
OVERALL LENGTH	1 5/8"	1 3/8"	3½"	2¼"
MAXIMUM DIAMETER	1 1/16"	1 1/16"	1"	1¼"
MODEL SIZE LIMIT (span)	16"	20"	36"	48"
MODEL WEIGHT LIMIT	1.5oz.	1.7oz.	5.0oz.	16.0oz.

JETEX 600 "SCORPION"



The newest, largest, and most efficient of the JETEX family; thrust is THREE TIMES the total weight! A superlative engine for spectacular speed and performance.

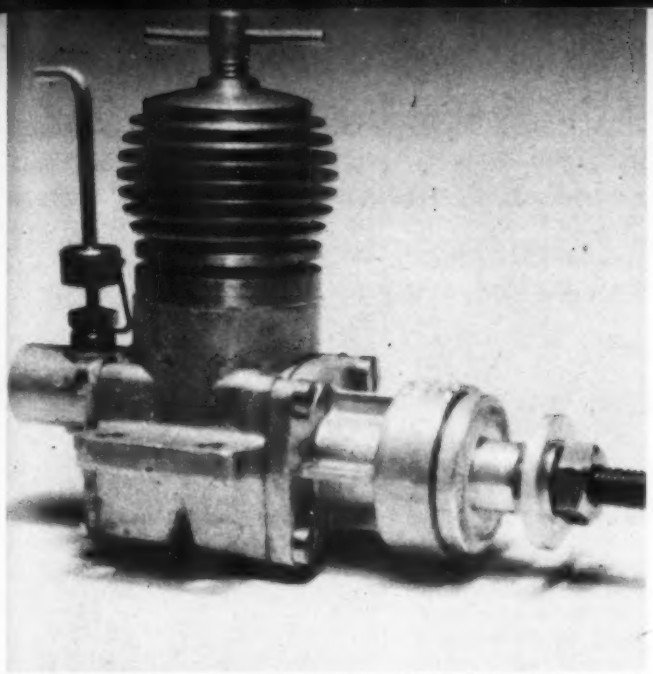
Price, with fuel, wick, instructions, AND 6-INCH AUGMENTER TUBE $8.95
JETEX NO. 600 "Red Spot" fuel—10 pellets with wick and spare washers $1.95

AMERICAN TELASCO LTD., *Huntington, N. Y.*

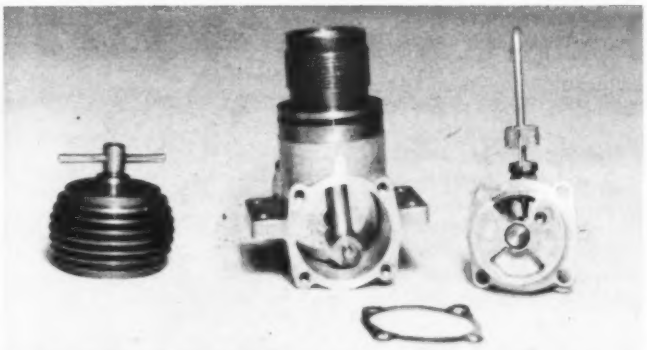
BOOM in German ENGINES

by P. G. F. CHINN

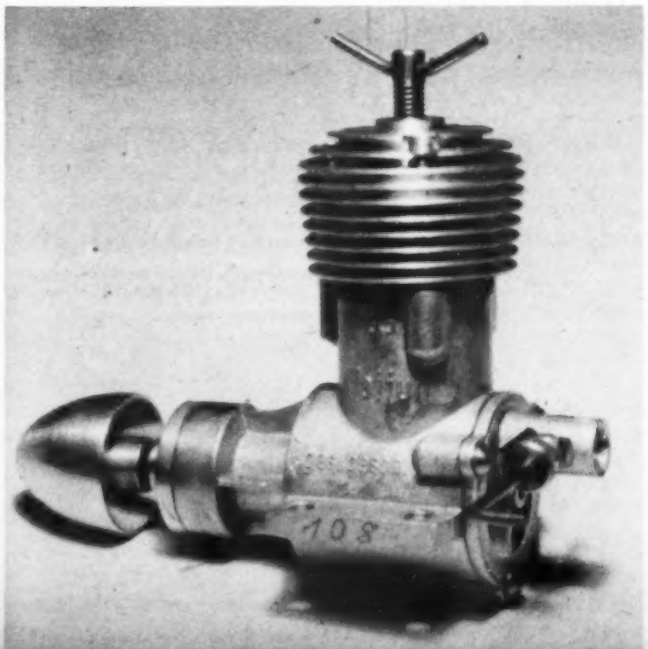
Production is rapidly expanding to meet a big demand for good West German motors.



Capable of 20,000 rpm with small fan, peak at 16,000, Webra Mach 1, a .15, probably is unsurpassed in power by any engine of its size. Double ball bearing.

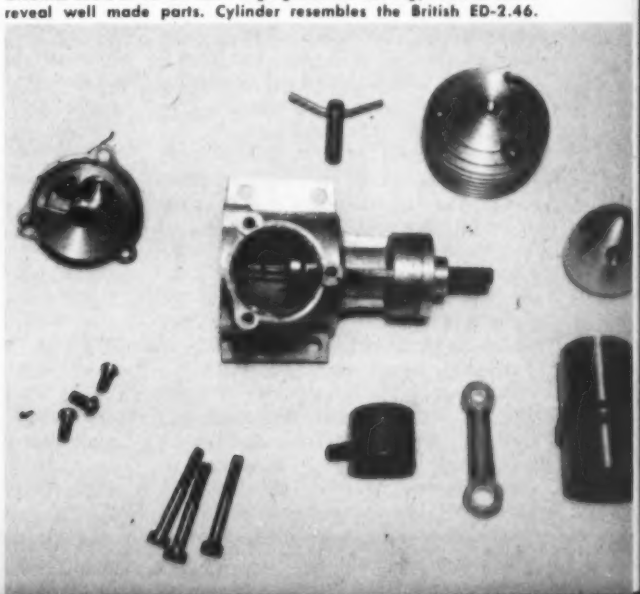


Webra Mach 1 features disc valve, rear needle valve and venturi. An unusual operating characteristic for racing engine is easy hand starting on small prop.



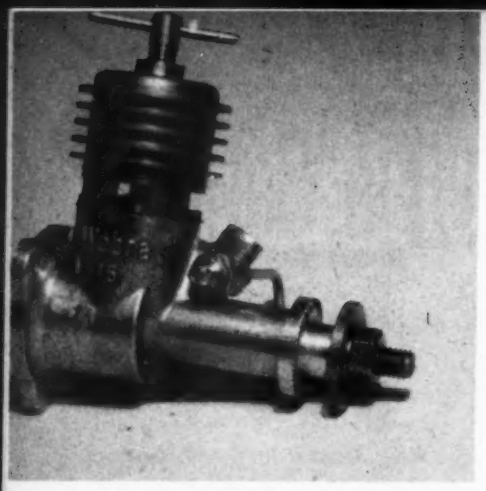
Taifun-Super 3.5, or .21, Diesel features twin ball bearings and a rear disc valve. Seven models in Taifun range are popular engines.

External shots of Taifun show high grade die-casting; internal views reveal well made parts. Cylinder resembles the British ED-2.46.

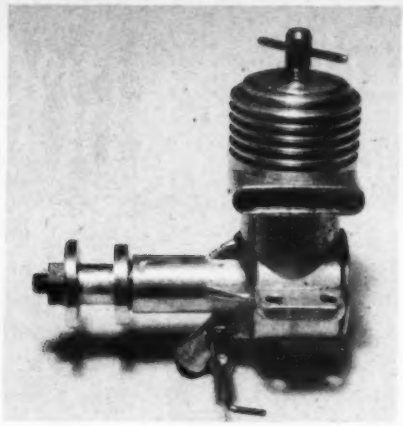


Little more than a year ago we had to report that, although many new German engines had been announced, few had reached the market in any quantity. Today, one German manufacturer is turning out around 250 engines per week and total production is running at the rate of about 20,000 a year. It may be remarked that British production is eight or ten times this figure and American production four or five times as great again. But we must remember that, following the model flying restrictions imposed on the Germans by the Allied Powers after W.W. II and their consequent retarding effect on the development of the hobby, the market in Germany itself is still relatively small; also, that, while American and British production levels are practically static at the present time, German output is still rising quite fast.

Germany's biggest producers of model engines at the present time are Bragenitz & Co., makers of the well known Webra Diesel, who are located in the U.S. sector of Berlin. This firm, which trades under the title Fein und Modell Technik, was formed early last year by the amalgamation of Modell-Technik, retailers, wholesalers, importers and exporters of modeling merchandise, and Fein-Technik, designers and manufacturers of the Webra Diesel. The firm is under the direction of M. Bragenitz,



Compact, powerful Webra .09 Record, made in Berlin. Low bore/stroke ratio gives high output.



Best Russian zone engine is Wilo .15. Powerful, only engine in world with a front disc valve.

Wilo Fox, Arden type porting but opposite rotation, is .082 displacement. For radial mounts.

M. Eberth and an Englishman, Eric T. Spivey. They have a substantial export trade and send half their production to such countries as Belgium, Holland, Italy, Sweden and Switzerland. During 1954 they expect to boost this to 60 or 70 per cent with the help of increased shipments to the U.S.A. Two of their Diesels which are likely to interest American modelers are the *Mach 1*, a .15 cu. in. ultra high-speed competition engine, and a new easy-handling Half-A of .049 displacement.

The first production Webra was the radial mount *2.46* (.150 cu. in.) model introduced in 1951. It quickly outstripped all other German engines in popularity and is still in production. To English speaking customers it is known as the Webra *Winner* and is now available with beam mounts if preferred. It is a light and compact motor, using a stroke/bore ratio somewhat above more recent practice, but having radial porting and a crankshaft rotary valve. Our personal experience of this motor is that it handles well and gives a useful output. However, for those who require really hot performance, the *Mach 1*, introduced in the fall of 1953, will be of the greater interest.

This is a short stroke ball-bearing motor of .149 cu. in. displacement. Unlike other 2.5 c.c. class Diesels having such refinements as twin ball bearings and disk valves, it is a very compact motor and is actually fractionally lower in height than the K & B Torpedo .15. A speed model, built by Günther Bodemann for this engine, has hit 172 km./hr. (106.88 mph) which is one of the highest, if not the highest, speeds put up by a .15 cu. in. powered model in Europe.

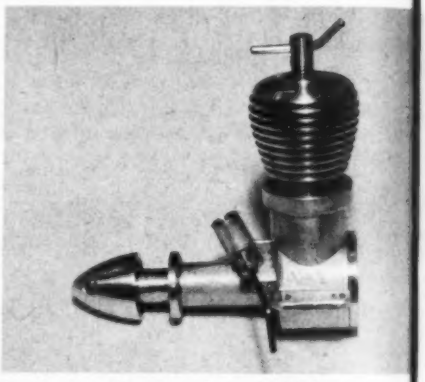
The carburetor throat, with its open type jet, is a good deal bigger in area than on the average European 2.5 c.c. motor and, to adjust intake velocity to the wide speed range of which the engine is capable, the jet and needle block can be screwed in or out of the venturi.

One thing that surprised us about this engine was its non-critical starting. The *Mach 1* is designed for very high speed operation and one of the disadvantages of most Diesels is that, when lightly loaded, as with a small, high speed prop, they become vicious and hard to start by hand. The engine fires so abruptly that it becomes increasingly difficult to get one's fingers out of the way before the other prop blade snaps round and raps them sharply and painfully. With the *Mach 1*, this tendency is lessened because the engine will start and run on a wide variety of mixture strength and compression settings and it is therefore possible to retard the ignition point by slackening off the compression screw and to get the engine to sputter away in short bursts at low speed before advancing the compression up to full revolutions.

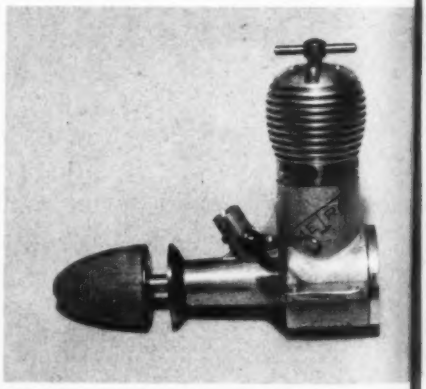
This engine will, given a really small prop or fan-brake (about 5-1/2 x4), exceed 20,000 rpm: a very high figure for a Diesel and one which also reflects its high peak rpm of around 16,000. The maximum horsepower output of approximately .3 bhp is probably unsurpassed by any quantity produced 2.5 c.c. motor in the world today.

An .09 cu. in. Webra Diesel, known as the *Record*, is also in production. This follows the constructional layout of the .15 *Winner* but has a much lower stroke/bore ratio and modified porting and we found it to achieve a substantially higher specific output. Originally a radial mount job, a new crankcase, having combined beam and radial lugs, rather like some of the OK Cub models, is now also being made.

Fein & Modell Technik's next project is an .049 Diesel. Only in the drawing board stage at this writing, this new model was to appear at the Nuremburg trade fair in March, 1954. In order to keep the price as competitive as possible, the manufacturers are aiming at a simple layout and will also concentrate on achieving easy starting and handling,

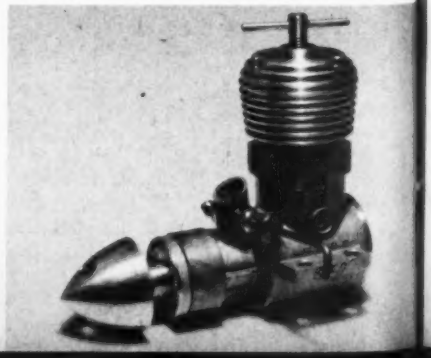


Another new German make is .06 WAF 1. It is well built in small numbers, has unusual porting.



The Metro 52, shaft-valve .15 with many unusual features, built in the American Zone, Berlin.

The Graupner Taifun, .15 displacement, twin ball bearing, shaft valve, has 360-degree porting.



GERMAN MODEL MOTORS 1953-54

	Type	Displacement c.c.	Displacement cu. in.	Bore x Stroke in.	Bore x Stroke in.	S/B Ratio (to 1)	Weight oz.	BHP at RPM	Intake System	Mounting
BWM 50	Diesel	0.48	.029	–	–	–	–	.04 at 11,000	Shaft valve	Beam/radial
Wilo Boy	Diesel	0.71	.043	.394	.354	0.900	1.4	.05 at 10,000	Shaft valve	Radial
Frank 1	Diesel	0.75	.045	–	–	–	–	– –	Shaft valve	Beam/radial
Webra .049	Diesel	0.8	.049	–	–	–	–	– –	–	–
WAF 1	Diesel	0.98	.060	.402	.472	1.176	2.6	.09 at 12,000	Shaft valve	Beam
BWM 100	Diesel*	0.98	.060	.433	.405	0.936	2.5	.1** at 10,000	Shaft valve	Beam/radial
Taifun Junior	Diesel	0.98	.060	.441	.394	0.893	3.0	.1** at 12,000	Shaft valve	Beam
Wilo Fox	Diesel	1.36	.082	.472	.472	1.000	2.6	.075 at 9,000	Shaft valve	Radial
Taifun Record	Diesel	1.49	.090	.512	.441	0.861	3.2	.16** at 12,500	Shaft valve	Beam
BWM 150	Diesel*	1.49	.090	.500	.461	0.921	3.2	.12 at 12,500	Shaft valve	Beam/radial
Webra Record	Diesel	1.53	.093	.512	.453	0.885	2.8	.16 at 14,000	Shaft valve	Radial
Wilo 2.45 c.c.	Diesel	2.45	.149	.610	.512	0.832	3.5	.25 at 14,000	Crankdisk valve	Beam
Webra Mach 1	Diesel	2.45	.149	.610	.512	0.832	4.7	.30 at 16,000	Disk valve	Beam
BWM 250	Diesel*	2.46	.150	.551	.630	1.143	3.6	.23 at 12,500	Shaft valve	Beam/radial
Webra Winner	Diesel	2.46	.150	.551	.630	1.143	3.6	.22 at 11,000	Shaft valve	Radial or beam
BWM 251	Diesel*	2.47	.151	.591	.551	0.933	5.5	.27 at 15,000	Disk valve	Beam
Metro 52	Diesel	2.47	.151	.591	.551	0.933	3.8	.20 at 11,000	Shaft valve	Beam
RGU 2.5	Diesel	2.47	.151	.591	.551	0.933	–	– –	3-port	Beam
Taifun Blitz	Diesel	2.47	.151	.591	.551	0.933	5.0	.23 at 13,000	Shaft valve	Beam
Taifun Rennmotor 2.5	Diesel	2.47	.151	.591	.551	0.933	5.8	.25 at 14,000	Shaft valve	Beam
Taifun Rennmotor Meteor	Diesel	2.47	.151	.591	.551	0.933	6.2	.27 at 14,500	Disk valve	Beam
Wilo Pony	Diesel	2.47	.151	.591	.551	0.933	3.8	.23**	Shaft valve	Beam
RGU Universa	Diesel	2.65	.162	.591	.591	1.000	7.0	.16 at 8,000	3-port	Beam
Taifun Rennmotor 3.5	Diesel	3.44	.210	.657	.618	0.940	6.3	.32 at 13,000	Shaft valve	Beam
Taifun Rennmotor Super	Diesel	3.44	.210	.657	.618	0.940	6.7	.34 at 13,500	Disk valve	Beam
L.B. 460	Glowplug	5.	.3	–	–	–	6.5	.5**	Shaft valve	Shaft valve
BWM 1001	Glowplug	9.95	.607	.945	.866	0.917	14.3	1.00** at 12,000	Disk valve	Beam

*Glowplug version listed

**Maker's claimed performance.

rather than extra high power, since the new motor is aimed primarily at the junior market and sport flier.

A feature of Webra engines produced thus far and one which, we feel, we should mention for the benefit of readers encountering these engines, has been an unusual cylinder design which demands a somewhat longer break-in period than most. Two to three hours—sometimes more—is generally necessary before these engines loosen up sufficiently to give continuous full power.

The vast majority of German model engines are Diesels and of under .2 cu. in. displacement. This is in accordance with demand in most European countries where, after some considerable interest in glow plug motors around 1950, the Diesel is once again predominant.

The only German firm which has listed glow plug type motors in any numbers has been *BWM* concern: *Berliner Werkstätten fur Modellmechanik.* In 1952, this maker announced a series of five Diesels (.029, .060, .090, .150 and .151 cu. in.) and two glow motors (.29 and .60 cu. in.) All but the smallest of the Diesels were also listed in glow plug versions. However, production seems to have been mainly concentrated on the 150 and 250 (.09 and .15 cu. in.) Diesel models. These are shaft valve, circumferential port motors, similar in general layout to the British Frog 150 engine. The current *250D* model has one or two improvements on the original version and is reduced in price. It has an inclined needle-valve assembly to keep the fingers away from the prop and a right angled fuel feed.

After the Webra, Germany's second most popular model engines are the Taifun range. The design and manufacture of these engines is the responsibility of a Herr Hornlein in Vöhringen-an-der-Iller and they are marketed through the firm of Johannes Graupner of Kirkheim-Teck, a sizable wholesaler who also handles plan publication, fuels, props and accessories.

There are seven models in the present Taifun range, the first of which we tried out shortly after its introduction last summer. This was the 2.47 c.c. twin ball bearing shaft valve model. These engines are, perhaps, the best looking motors yet produced in Germany. The die-casting is exceptionally good. We discovered that the shaft valve model started and ran well and although the power output of this first example was not exceptional, it was, we felt, a design which would readily lend itself to further development. Subsequently, we acquired two of the recent ballbearing disk-valve models which confirmed us in this belief.

The basic design layout of the Taifun is common to (*Continued on page* 49)

POW WOW

by BOB PALMER

Gross weight of only two pounds, combined with a wing area of 432 sq. in., not including flaps, means smoother flying around tighter maneuvers. Despite light weight, finish is a point maker.

Those new, tougher, stunt rules call for a better airplane than ever. And this, cousin, is just the ship you need to look good at contests during coming season.

If you have seen the new stunt rules, you'll know that stunts are tighter and start in the vertex of the 8's. This calls for a better airplane, more practice, and possibly longer lines, for with longer lines, the more distance you have between the maximum 45° and the ground. Pow Wow has an area of 432 sq. in., not including flaps, and weighs 2 lb. At this weight, however, it is not advisable to use under 60 ft. lines. I use 60 ft. lines myself and notice a little wing wobbling if the engine gets set off a little rich. This is caused by excessive line drag.

You will notice by the wood call-outs on the drawing that a minimum of thickness is required. This was necessary to have a light aircraft. It will pay off in good tight stunts and square corners. I have cut down the flap movement and increased the chord, resulting in less slowdown in stunts and giving tighter stunts, although this is caused partly by light weight.

The landing gear may seem to be too far back to the average modeler, but actually it is in its right place for good take-off and especially for landings. The model has never nosed over in either take-off or landing.

The wing is thick and its high point moved forward. This produces good lift and diminishes the stalling point needed for better performance. Care in making a rounded nose on the leading edge will give better results.

I have moved the tail up on this model to clear any irregular air flow from the deflected flaps and after flying the model, I believe it pays off. Good responsive controls are maintained through all the stunts.

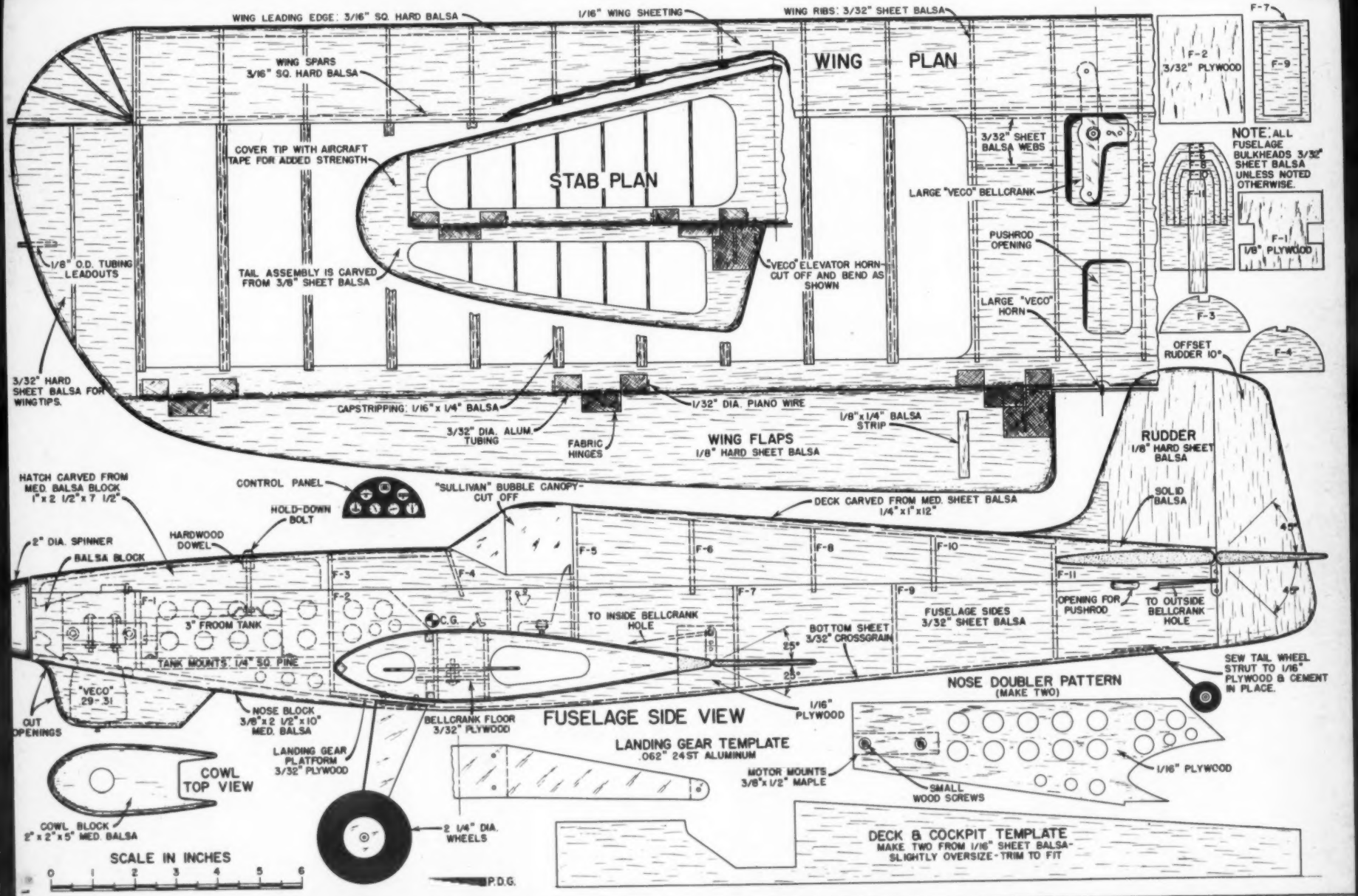
Bellcrank floor should be of two thicknesses of plywood where the bolt hold down is and cemented several times to insure its staying put.

This landing gear is placed properly for take-offs and landings—Pow Wow has never nosed over! Powered with a Veco .29 or .31—plenty of good .29's to pick from, though—the ship has looks.

I decided not to use tape hinges on this model. To make a model pop well or do very good square corners, it is very necessary to have the controls work freely. They should move at the slightest touch: no delayed action. With taped hinges—unless great care in doping and painting is taken—the modeler will have trouble. I have built a good many models and there are very few models that I have had in which the controls worked freely when the model was new. It seems that after the model has been flown for a while, the hinges loosen up because the fuel gets into them. I used tubing in this model, and music wire, drilling out the tubing a bit to be sure of no binding and to facilitate lining up. As a result, the controls moved freely from the start.

I think the drawing is complete and clear enough for you to go ahead and start building. But please do select the materials well, using firm, soft, light wood. I know you will be satisfied with this model to help you get those stunts down to the present AMA rules. Good luck!

END

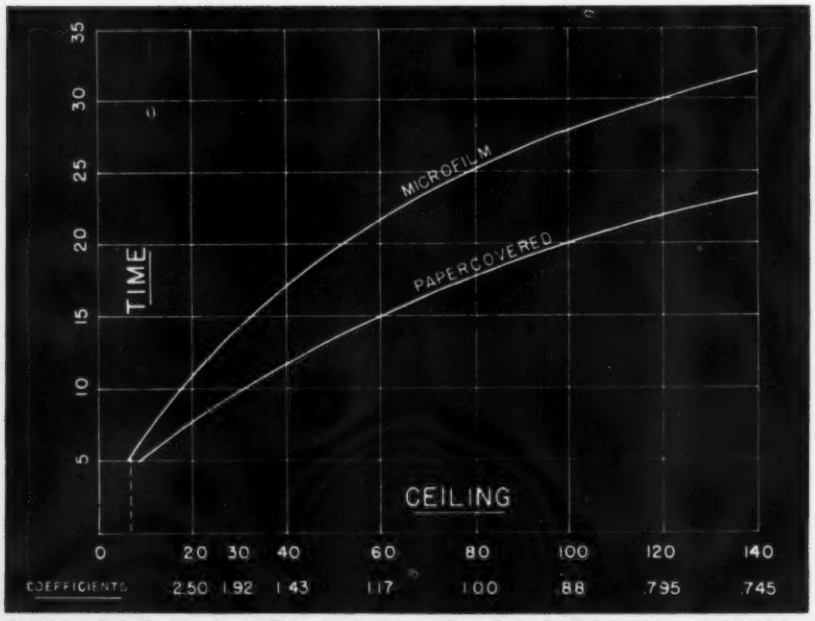


FULL SIZE PLANS AVAILABLE. SEE PAGE 50.

Flights of approximately a half hour's duration have been achieved indoors by several fliers, such as engine manufacturer Bill Atwood, foreground, preparing to fly in Santa Ana airship dock.

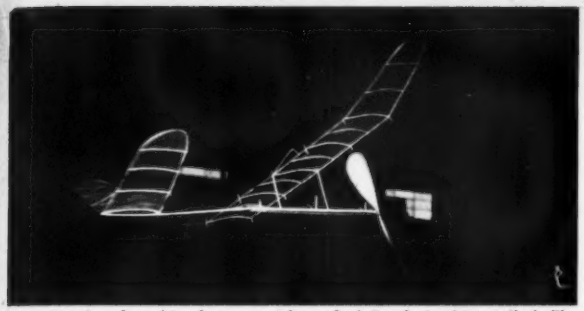
Author launches Featherette. Did poor 4:00 under 100 ft. ceiling; 2:30 with 25 ft. ceiling.

Should We Scrap Microfilm?

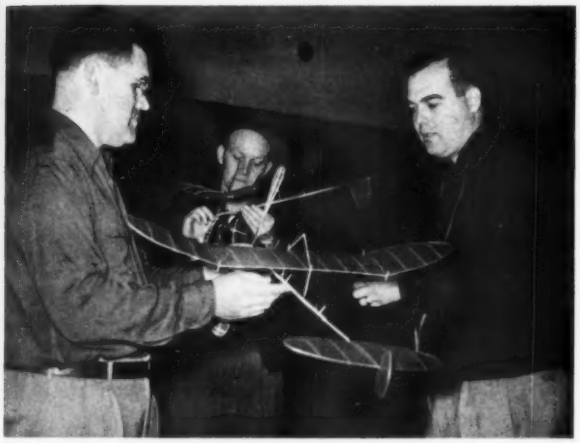


Directions: Multiply time by coefficient under your ceiling. Example: 7-1/2 minutes under 30 ft., multiplied by 1.92, gives 17-1/2 minutes corrected time. All times corrected to 80-ft. ceiling times.

Steve Pettol, youngest member Oakland Cloud Dusters, launches model. Holds outdoor record.



Immediately after this shot was taken, Carl Rambo's ship stalled. The right wing tip can be seen as it began to twist. Bit skimpy, said Carl.



Charles Pottol, left, and Joe Foster, prepare Joe's plane. Covered with condenser paper, 50% of weight. Foot rubber loop varied 1/16 to 1/8.

Thirteen-year-old Jeffery Oh, Oakland, launches Jasco ROG. Best time 1:40. Prop from 1/32 in. sheet balsa. Jeffery holds Jr. Wakefield record.

Once popular coast-to-coast, indoor flying is dead on its feet. Why? What can be done? Throw out microfilm, and institute one class of 100 sq. in. models, says the author, and indoors is emancipated from armories and airship docks, and can be flown in many hundreds of practical flying sites around the country. Clubs take note.

by HAL ROTH

▶ Let's face it. Indoor flying is in bad shape—in fact, it is almost non-existent. According to the beginners: (1) the planes are too difficult to build; (2) there is no place to fly. The experts say the trouble is: (1) no place to fly; (2) the inferior quality of post-1946 rubber, which consistently makes the pre-war rubber possessor the winner.

I propose changing the indoor rules to eliminate microfilm covering on rubber models and substitute one class of 100 sq. in. models for both stick and cabin.

If indoor flying is going to be salvaged from the all-time low where it is now, drastic changes have got to be made. At the 1941 Nationals there were 20 Junior, 67 Senior, and 43 Open entries in the indoor stick and cabin events. At the 1951 Nationals there were 10 Junior, 4 Senior, and 12 Open entries in the indoor rubber events. *Twelve Open fliers at a national meet!*

Besides the Nationals, there have been only two record trials a year for the past five years: *10 chances to fly for record since 1948!*

The existence of such a restricted class of model flying officially recognized by the AMA is ridiculous. Any type of model flying supposedly on a national level and which can be fully flown in only two or three places (Navy dirigible hangars) is absurd.

The alternate to changing indoor rubber rules is to let things remain as they are. And *all* indoor rubber flying will eventually stop. It is asking too much that national sponsorship continue for an event that draws 12 Open entries at the biggest meet in the country. Indoor will simply not be scheduled one year and that will be the end (like CO_2). If the purists want to continue indoor as it is now, then it should be dropped from the AMA slate—left to those stamp collectors who only collect triangles from Tibet.

There is talk about the "old time experts" who fly indoor models. Where are they? With due respect, I say that their indoor flying has atrophied until there is nothing left. Twelve *Open* entries in both indoor stick and cabin at the 1951 Nationals. The fact is that many of the old timers have quietly slipped away and with no younger replacements, the present-day indoor flying situation has developed.

It is suggested that the indoor experts who are now in the 25-30 minute class would welcome a type of flying oftener than once a year at the Nationals or occasional record trials.

The fun of indoor flying is gone because competition is lacking.

A major indoor rule change to smaller tissue-covered models would mean hundreds of small flying sites could be used all over the country. With a prorated ceiling adjustment (see below), indoor flying could be equalized on a nation-wide basis. In most cities, 25-60 ft. ceilinged sites are available. Modern auditoriums (*Continued on page* 39)

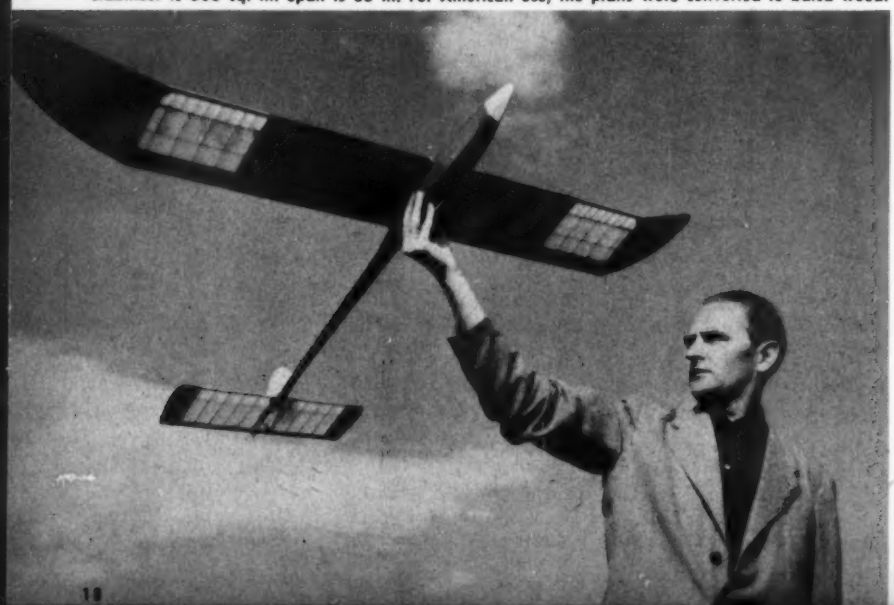
Hans Hansen, present world glider champion, with his finely finished A.2, and the Swedish Trophy, which he won at Bled. The size of this very famous trophy is in inverse proportion to its prestige.

HANS HANSEN'S WORLD'S CHAMPIONSHIP GLIDER

by BILL DEAN

Behind the three perfect flights that won at Bled, Yugoslavia, in 1953, was painstaking design development through 45 models.

Graceful lines of Hansen's tip-dihedralled glider show up well in this view. Total area of wing and stabilizer is 500 sq. in. Span is 65 in. For American use, the plans were converted to balsa wood.



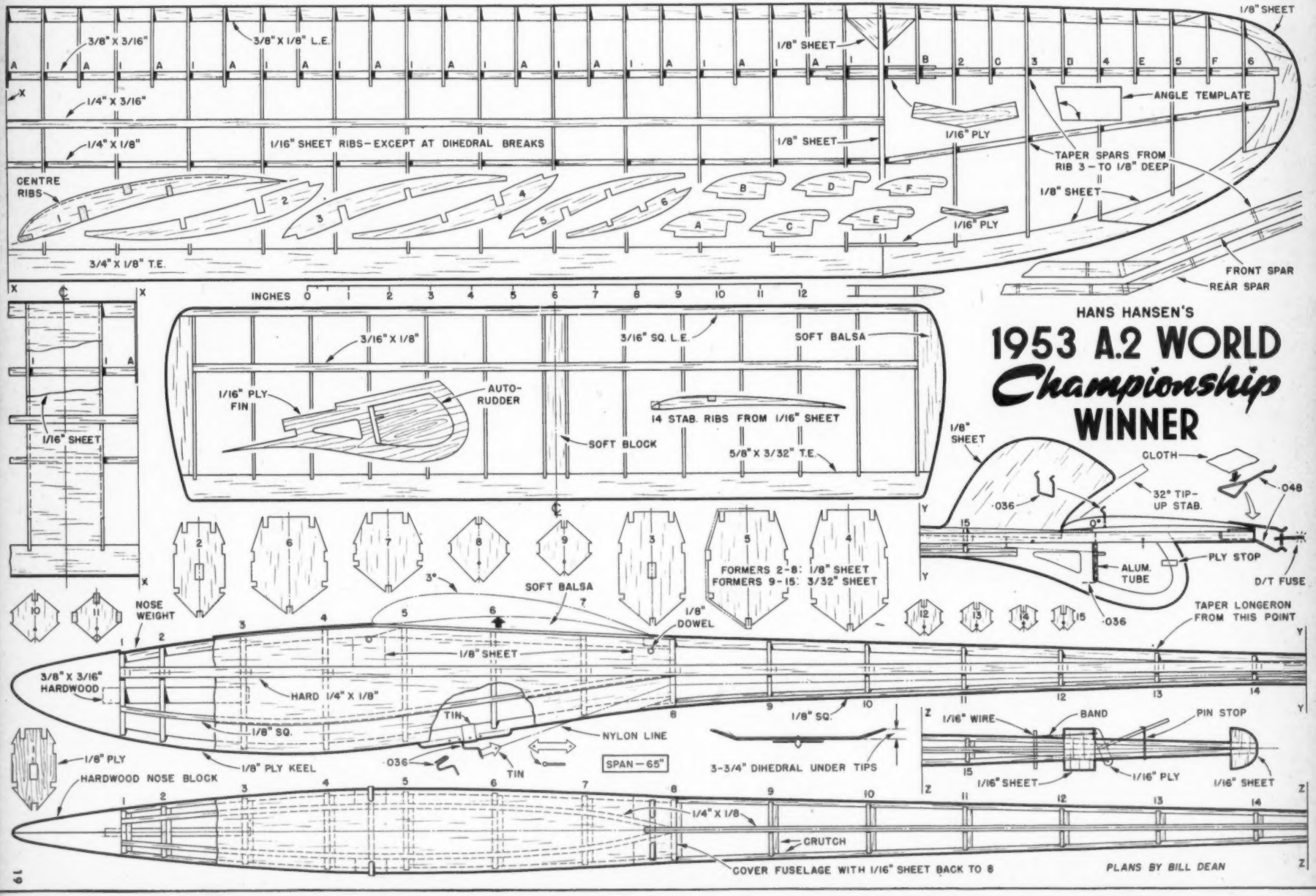
▶ Winner of the '53 World Glider Championship, this outstanding A.2 design by Hans Hansen is capable of a genuine 4-1/2-5 minutes in still air, from a standard 328 ft. towline. (A.2 towline length has been halved to 164 ft. for '54 contest.) At the actual contest held at Bled in Yugoslavia, the model turned in three perfect six-minute flights (a "max" was 5 minutes), while at the Danish Nationals earlier the same year, it also took first place with a three flight total of 14:36, in early morning air. The design is the latest in a long series of something like 45 gliders by this leading Danish modeler. Differing from many of the fragile and "tricky" models seen at the '53 Championship, Hansen's glider is a rugged, easy-to-fly design that is capable of good performance in both turbulent and calm conditions.

Like most A.2's from the Nordic group of countries, the original model was built mainly from spruce, which resulted in an all-up weight of 16 oz.—1-1/2 oz. above the possible minimum. Hans Hansen has approved the use of balsa in the construction (with "beefed up" sizes) for this magazine plan in order to bring down the weight and still further improve the performance, as well as bring it into line with American building methods. However, if you wish to make an exact replica of the original, notes on the hardwood construction and a sketch showing material dimensions are given at the end of this article.

Construction is quite simple, but we suggest that you follow the correct building sequence for the shortest possible building time. Begin by cutting out all sheet parts from medium weight balsa, making 26 of each of the main (1) ribs and 24 of the "A" half-ribs. Make modified main ribs for the center section and dihedral breaks (see plan). The fuselage keel, nose former, lower fin and dihedral braces are cut from ply. Choose good hard balsa (48 in. lengths) for the spars and the fuselage crutch.

The fuselage consists of a normal crutch, with formers and stringers added —the forward portion being sheeted. Build the crutch from 1/4 x 1/8 in. directly over the top view of the fuselage. When dry, lift up and install the formers (1-15) in front of the cross pieces, making sure that they are all at right angles to the crutch. Now install the 1/4 x 1/8 in. rear upper longeron, after first tapering it on the lower edge from former No. 13. Add the lower *hard* 1/8 in. sq. strip, followed by the ply under-fin. Next comes the 1/8 in. ply keel, the 1/4 x 1/8 in. twin upper longerons (note joints at former No. 5) and the 1/8 in. sq. side stringers.

(*Continued on page* 48)



FULL SIZE PLANS AVAILABLE. SEE PAGE 50.

BLACK TISSUE GIVES A MODEL A FINISHED SPARKLING APPEARANCE.

PAA

PAA INSIGNIA IS SIMPLIFIED FOR EASY CUTTING.

A

STABILIZER MARKING FOR CLASS "A" MODEL

YELLOW TISSUE

GREEN TISSUE

YELLOW RED GREEN

RED TISSUE

HA

½A MODEL MARKING IS APPLIED TO MODEL IN TWO LAYERS - BOTTOM LAYER IS RED, YELLOW, GREEN, TISSUE CUT AS SHOWN - TOP LAYER IS BLACK.

EXAMPLE OF CLUB EMBLEM SIMPLIFIED AND CUT FROM TISSUE.

Texas Eagles

LUBBOCK, TEXAS

LETTERING OF THIS TYPE IS DONE ON TOP OF TISSUE LAYERS WITH SPEEDBALL PEN OR BRUSH AND INDIA INK.

SIMPLICITY OF DESIGN IS A KEYNOTE TO EASE AND NEATNESS OF TISSUE TRIM. TRY TO KEEP LETTERING ANGULAR FOR EASE OF CUTTING.

APPLY TISSUE TRIM WITH VERY THIN CLEAR DOPE.

BLACK TISSUE TOP LAYER

BLACK CIRCLE WITH "E" CUT OUT.

YELLOW TISSUE BOTTOM LAYER

RED TISSUE CIRCLE IS UNDER BLACK CIRCLE.

THE "EAGLE" INSIGNIA IS GIVEN TO SHOW HOW A MODELER CAN CREATE HIS OWN CLUB INSIGNIA IN COLORS.

BLACK TISSUE STRIPS ARE FINE FOR WINDOWS ON CABIN MODELS.

NCXP

LAYING OUT NUMERALS OR LETTERS IS EASY... MOST LINES ARE STRAIGHT.

GOOD PORPORTIONS FOR LETTERS OR NUMERALS, 2 INCHES WIDE, 3 INCHES HIGH, 1/2 INCH = WIDTH OF STAFF.

NUMERALS 3 8 8 MAY BE CUT FROM SAME LAYOUT.

NUMERALS 6 8 9 ARE SAME, NUMERAL 6 TURNED 180° = 9.

NUMERALS 2 8 5 ARE SIMILAR - USE DOTTED LINE FOR NUMERAL 5.

NOT SHOWN ARE Q, I, Z THEY ARE SIMPLE. O IS SAME AS 8 WITHOUT CROSSBAR & CUT-OUTS ON SIDES.

DOTTED LINE INDICATES NUMERAL "3."

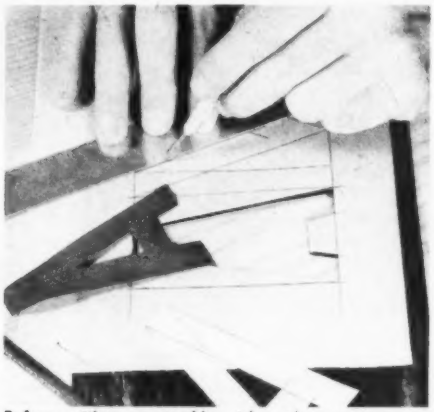
TISSUE HAPPY

by PAUL GILLIAM

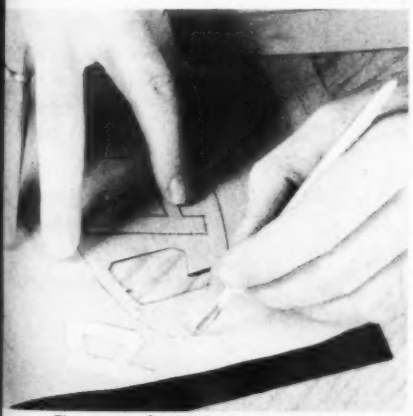
Any job can look like a million bucks, even when weight limitations, or cost, may rule out color-doped finish. It's thisaway.

Decorative effects can be many and varied, gaily colored, for insignias, names or license numbers.

Make layout, sketch, on vellum, or other type of paper in pencil, using the straight edge.



Before cutting, or marking trim, place wax paper under drawing. Prevents tissue tears. Cut sharp knife.



Tissue may be stacked in many layers, cutting extra pieces for other models, future.

Most any design can be cut from tissue and applied to model, as shown here by sketch, left; ship, right.

Strips cut with straight edge. Soft brush, thin dope, coat dope through from the top side.

Place the decoration in position, then dope over it as shown. This method of application avoids wrinkles.

MAN has already given us complete illustrations on how to cover models (*Virgil Cone, "How to Cover," MAN, July* '53); we will tell how to add a sparkling touch to the model after it has been basically covered with a favorite material.

Most of us have attended a model meet and have seen some models that looked much better than others—it might have been craftsmanship, color, tasteful trim, harmony or contrast. It is most likely that the models that were stand-outs for appearance were the models that had black tissue trim in some form or design.

Black tissue trim can make a model "sing" for beauty appearance. This trim may be used on the model in many forms, such as: 1. license numbers; 2. model names; 3. club names; 4. model marking numbers; 5. model type and class identification; 6. club insignias. Any of these listed ideas for model decoration will enhance a model's eye appeal.

Black tissue decorating trim is easy to cut out with model knife or single-edge razor blade. Tissue may be folded or stacked and as many as 24 layers cut out at one time. Sketch desired design or numerals and letters to be cut out in pencil on any type paper. Place sheet of wax paper under the paper that contains the sketch to be cut. Place both of these sheets over black tissue, in corners to prevent slipping, and cut along the lines you have drawn or sketched. Remember that we can cut as many as 24 copies of our pattern sketch by stacking or folding tissue under the design to be cut out.

Some modelers may wonder why one would go to the trouble to cut out of tissue our license numbers and model markings, especially since we can buy decals of this sort. Some decals are available that well suit our purposes. However, most decals that are available for lettering and numerals are in stock sizes. In many cases, the use of stock decals makes (*Continued on page* 38)

▶ TUNING FOR SPEED

Calling all speed merchants! This is THE article you've been waiting for—if you simply must modify engines, here's how.

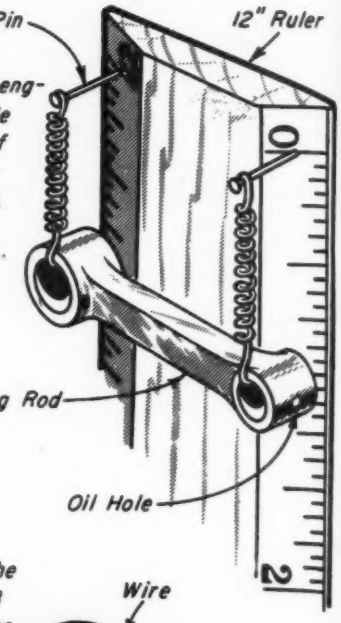
by E. C. Martin

▶ Speed flying is a brutally practical business and there is no room for design features that simply look nice. Every single component in a successful speed model is efficient, and anything superfluous costs mph. This is especially true of the engine, and it is vital that a type be used which produces the correct kind of performance: namely, the highest possible bhp at the highest rpm.

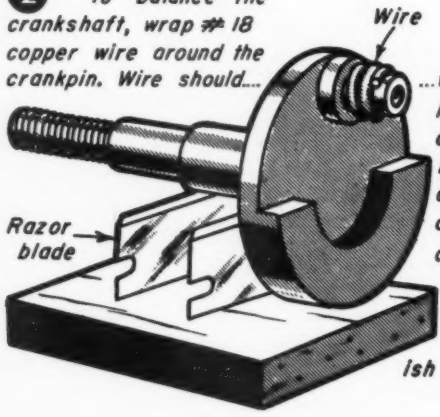
Participation in all classes is simplified if a design of engine is used which is available in all various class displacements. A standard model and installation layout may then be adopted, and a great deal of time saved. Since the only manufacturer who meets this requirement is Duromatic with the well known line of McCoy engines; and since McCoys have consistently proved themselves hard to beat, we will confine our remarks to this make, although much of what follows is applicable to the many other excellent engines currently available, and we do not suggest that the Macs are the only choice, but merely that they are most convenient. For example, the K & B .19 is a record breaker in Class A, and the Doolings are respected, both as a .29 and a .60. These remarks, therefore, should not be misconstrued to mean that one make of speed engine is better than another. But coming back to the McCoy family, the .29 is probably the most familiar size, and since we discussed this engine in connection with team racing modifications, it is perhaps instructive to (*Continued on page* 52)

Peak that engine at 18,000 rpm and you may jump that speed another 15 mph. You must know what you are doing—beginners don't tamper.

1 *After disassembling engine, drill 1/16" oil hole in the extreme top of the small end of the connecting rod. Next, simultaneously weigh rod ends as shown (see text).*

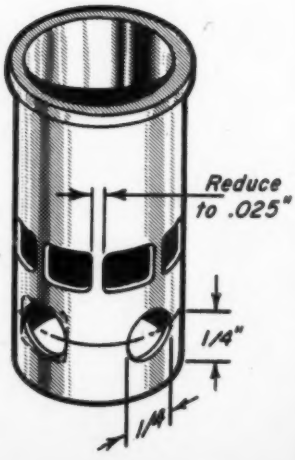


2 *To balance the crankshaft, wrap #18 copper wire around the crankpin. Wire should....*



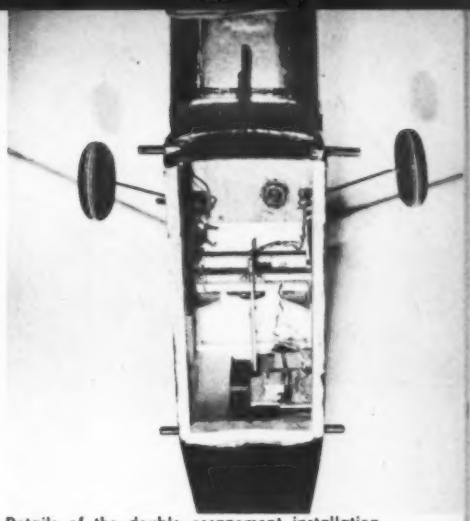
...weigh same as large end of connecting rod. Balance shaft on razor edges and drill out crankpin until shaft shows no tendency to roll. Polish counterweight.

3 *Enlarge exhaust ports in cylinder liner as indicated. Drill 1/4" D. holes in liner and piston (see text) and enlarge to a square. Radius all corners.*



Sketches by— Wennerstrom

Rear quarter view clearly shows elevator and rudder areas and the arrangement of the control rods. Pins on both surfaces may be moved to alter movement. Wheels are barely behind CG position.



Details of the double escapement installation. Two intermediates give adequate juice, life.

high diver

Any desirable characteristics result from experiments with NACA 2412 airfoil. For flying either rudder only, or with elevators, stunting improved.

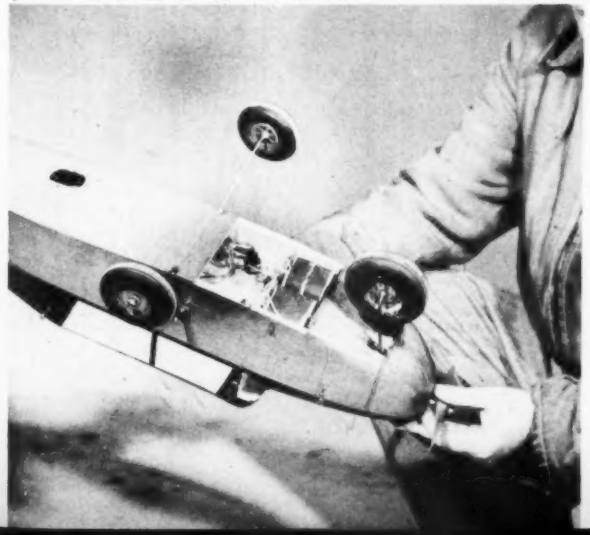
After deBolt's experiments with the full symmetrical airfoil and short coupling, à là the U-control stunt, the High Diver was begun as a more moderate experiment, using convex undercamber (NACA 2412 airfoil) in combination with both rudder and elevator. Not only did results warrant this plan, but a number of interesting possibilities were revealed.

The elimination of ballooning is, perhaps, the most important. The minimum airplane that would incorporate sufficient structural strength to survive anticipated air loads imposed by violent pull-outs, and, perhaps, inverted maneuvers, carrying two escapements and a really reliable complement of batteries, appeared to be approximately 3-3/4 lb. gross (spun in on dirt, it broke a prop), which, at about 18 oz. per square foot of area, works out to a little under 5-ft. span. To gain area without excessive span, an aspect ratio of about 5-3/4 to 1 was employed. The combination of airfoil selected and rather high weight meant a fast moving ship during elevator maneuvers, so moderate power, a K & B .15, was called for. A .19 would be murder on a small fast ship using flippers that really react, but will go nicely in a rudder-only version where high performance is desired. A 9 x 6 Power Prop allowed the .15 to rev up; despite the high pitch, the engine would over-rev in inverted dives, sounding like a speed ignition engine with floating points. Although a wedge tank, point down, will run off during any normal rudder-only maneuver, abrupt pull-outs impose G-loads that compel a Walker pressure tank.

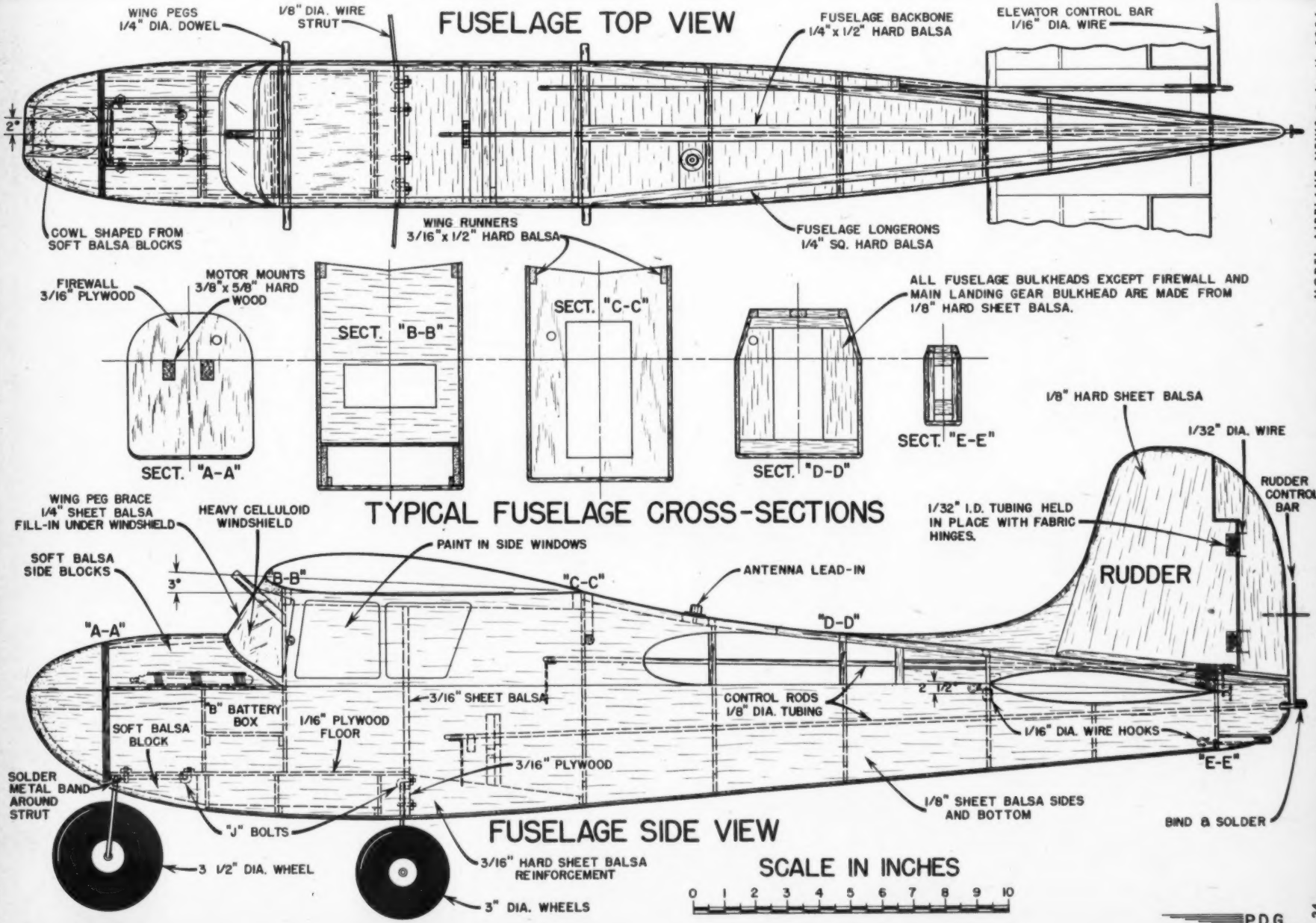
Flight characteristics, generally more like full scale than model, were different from any seen in 12 previous, more orthodox, layouts, so much so, in fact, that we misinterpreted hand glide symptoms and put the ship away for two months, thinking it a failure. (*Continued on page* 41)

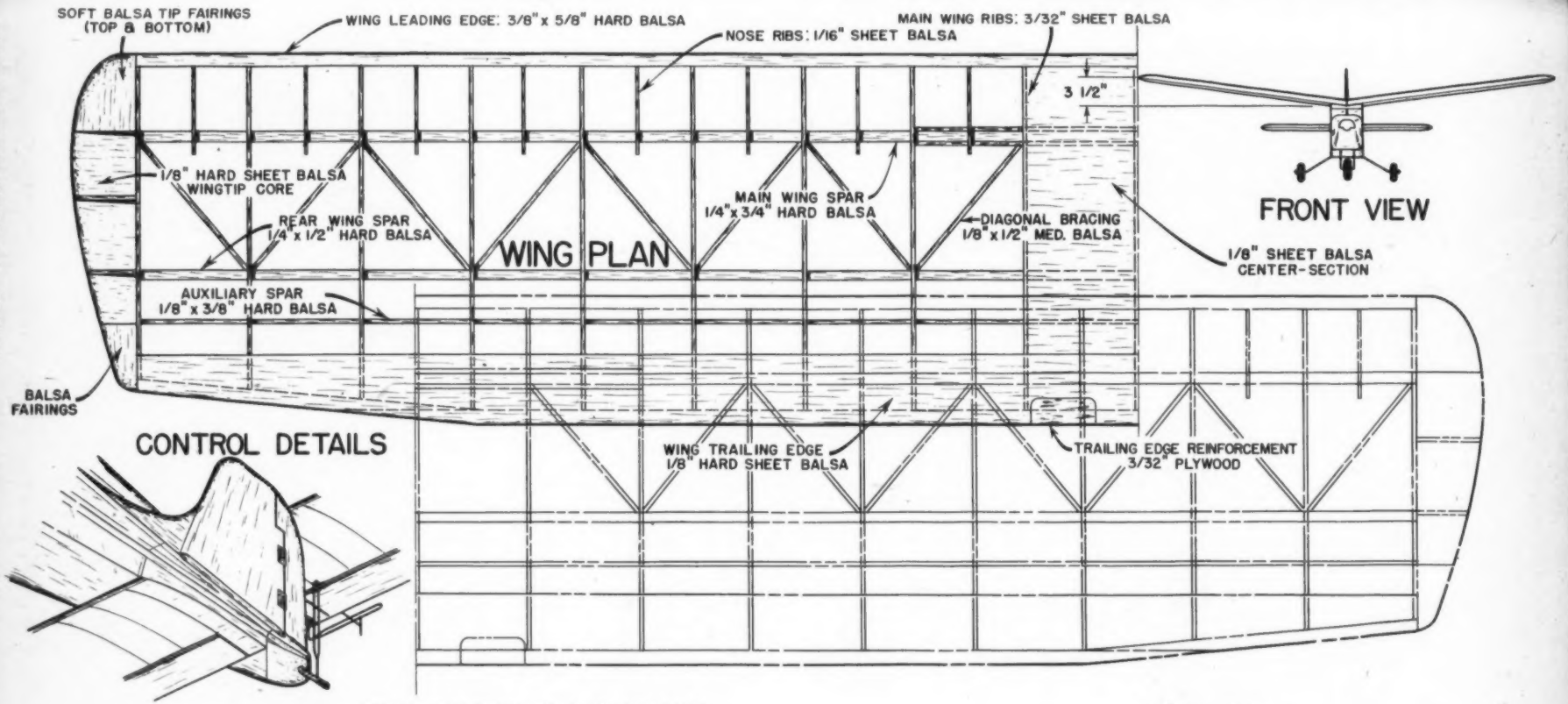
PLANS FOR HIGH DIVER ON FOLLOWING TWO PAGES

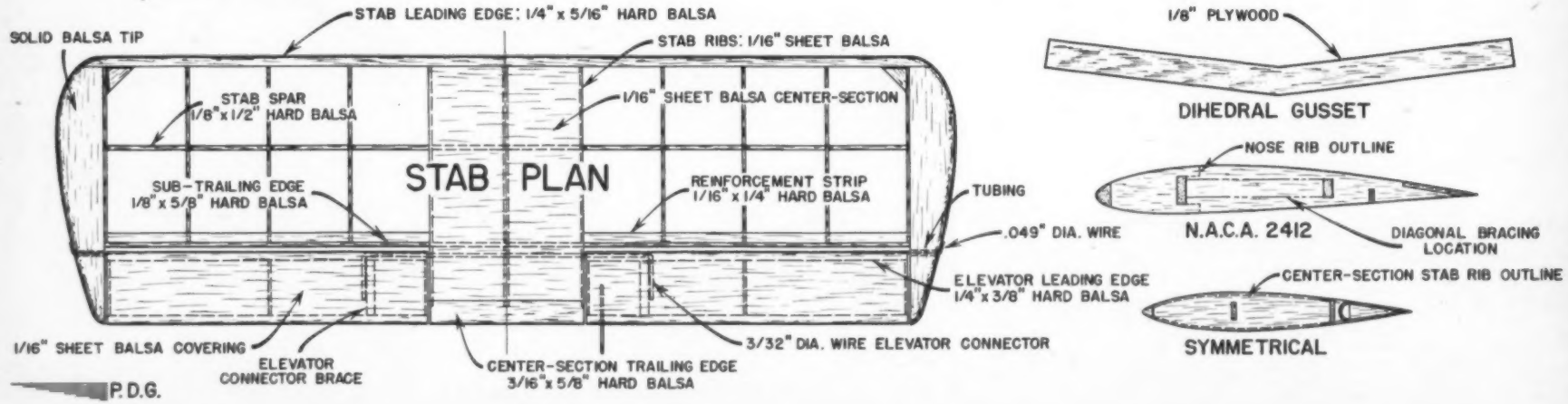
Four intermediates fit snugly side by side, plug in for replacement. It is possible to fit all of the batteries here when smaller sizes used.



Compact lines distinguish the stunt airplane. Further development would lead toward cabin version of a U-control type stunt model. And why not?


FUSELAGE TOP VIEW
WING PEGS 1/4" DIA. DOWEL
1/8" DIA. WIRE STRUT
FUSELAGE BACKBONE 1/4" x 1/2" HARD BALSA
ELEVATOR CONTROL BAR 1/16" DIA. WIRE
2"
COWL SHAPED FROM SOFT BALSA BLOCKS
WING RUNNERS 3/16" x 1/2" HARD BALSA
FUSELAGE LONGERONS 1/4" SQ. HARD BALSA
FIREWALL 3/16" PLYWOOD
MOTOR MOUNTS 3/8" x 5/8" HARD WOOD
SECT. "A-A"
SECT. "B-B"
SECT. "C-C"
SECT. "D-D"
SECT. "E-E"
ALL FUSELAGE BULKHEADS EXCEPT FIREWALL AND MAIN LANDING GEAR BULKHEAD ARE MADE FROM 1/8" HARD SHEET BALSA.
TYPICAL FUSELAGE CROSS-SECTIONS
WING PEG BRACE 1/4" SHEET BALSA FILL-IN UNDER WINDSHIELD
HEAVY CELLULOID WINDSHIELD
PAINT IN SIDE WINDOWS
SOFT BALSA SIDE BLOCKS
3"
"A-A"
"B-B"
"C-C"
"D-D"
ANTENNA LEAD-IN
1/8" HARD SHEET BALSA
1/32" DIA. WIRE
RUDDER CONTROL BAR
1/32" I.D. TUBING HELD IN PLACE WITH FABRIC HINGES.
RUDDER
"B" BATTERY BOX
3/16" SHEET BALSA
1/16" PLYWOOD FLOOR
SOFT BALSA BLOCK
CONTROL RODS 1/8" DIA. TUBING
2 1/2"
1/16" DIA. WIRE HOOKS
"E-E"
SOLDER METAL BAND AROUND STRUT
3/16" PLYWOOD
1/8" SHEET BALSA SIDES AND BOTTOM
BIND & SOLDER
"J" BOLTS
3 1/2" DIA. WHEEL
3/16" HARD SHEET BALSA REINFORCEMENT
3" DIA. WHEELS
FUSELAGE SIDE VIEW
SCALE IN INCHES
0 1 2 3 4 5 6 7 8 9 10
P.D.G.


SOFT BALSA TIP FAIRINGS (TOP & BOTTOM)
WING LEADING EDGE: 3/8" x 5/8" HARD BALSA
NOSE RIBS: 1/16" SHEET BALSA
MAIN WING RIBS: 3/32" SHEET BALSA
3 1/2"
1/8" HARD SHEET BALSA WINGTIP CORE
REAR WING SPAR 1/4" x 1/2" HARD BALSA
MAIN WING SPAR 1/4" x 3/4" HARD BALSA
DIAGONAL BRACING 1/8" x 1/2" MED. BALSA
WING PLAN
FRONT VIEW
1/8" SHEET BALSA CENTER-SECTION
AUXILIARY SPAR 1/8" x 3/8" HARD BALSA
BALSA FAIRINGS
WING TRAILING EDGE 1/8" HARD SHEET BALSA
TRAILING EDGE REINFORCEMENT 3/32" PLYWOOD
CONTROL DETAILS

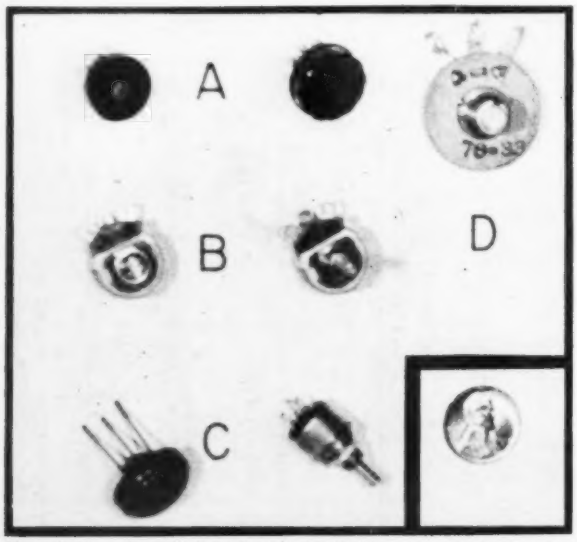

STAB LEADING EDGE: 1/4" x 5/16" HARD BALSA
SOLID BALSA TIP
STAB RIBS: 1/16" SHEET BALSA
STAB SPAR 1/8" x 1/2" HARD BALSA
1/16" SHEET BALSA CENTER-SECTION
STAB PLAN
SUB-TRAILING EDGE 1/8" x 5/8" HARD BALSA
REINFORCEMENT STRIP 1/16" x 1/4" HARD BALSA
TUBING
.049" DIA. WIRE
ELEVATOR LEADING EDGE 1/4" x 3/8" HARD BALSA
1/16" SHEET BALSA COVERING
ELEVATOR CONNECTOR BRACE
CENTER-SECTION TRAILING EDGE 3/16" x 5/8" HARD BALSA
3/32" DIA. WIRE ELEVATOR CONNECTOR
P.D.G.
1/8" PLYWOOD
DIHEDRAL GUSSET
NOSE RIB OUTLINE
N.A.C.A. 2412
DIAGONAL BRACING LOCATION
CENTER-SECTION STAB RIB OUTLINE
SYMMETRICAL

Radio Control News

by E. J. LORENZ

Hobbyists dream boat! Sterling Catalina Chris Craft kit, assembled by E. B. Chapman, using ED three-channel radio.

More fascinating dope on those target drones. A round-up of sub-miniature potentiometers, significant to the small plane fan; new products.



The selection of small, light "pots" detailed in copy may be compared here with the size of the penny in lower right-hand corner of photograph.

▶ Last month we gave a description of the receiver as used in the OQ-2A target drone. This month we'll cover the plane, engine and servo system.

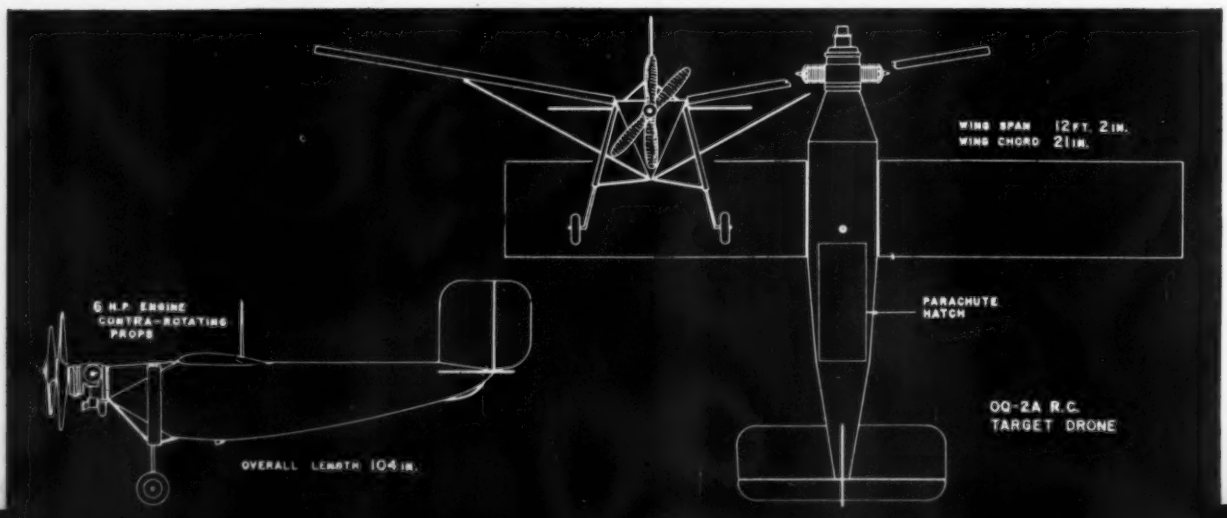
This 12 ft. 110 lb. target was well known to thousands of GI's, not only in this country, but abroad and even at sea. Its 6 hp twin cylinder engine with contra-rotating props gave a cruising speed of approximately 100 mph. Maneuvers in general were confined to those performed by rudder or elevator only and the skill of the ground control operator was the deciding factor.

The fuselage and empennage assembly were constructed of welded tubular steel and were fabric covered. The two spar wing was of wood-fabric construction and the wing struts, as well as the landing gear struts, were of steel tubing. The targets were painted bright red, broken only by the white on the top side of the wings or in some cases, white bars on the underside of the wing. Following are a few of the vital dimensions and figures on the drone in general:

Span, 146-11/16 in.; Over-all Length, 104-3/8 in.; Wing Area, 19.24 sq. ft.; Airfoil, NACA 23012; Wing Loading, 6.12 lb./sq./ft.; Fin Area, 1.5 sq. ft.; Rudder Area, .9 sq. ft.; Stab. Area, 3 sq. ft.; Elevator Area, 1.12 sq. ft.; Prop. Dia., 26 in.; Dihedral, 7°.

The OQ-2A target drone was launched from a 37 ft. catapult, placed facing into the wind with 100-yard radius clearance.

Power for the launching car was obtained from eight 3/4 in. stranded rubber cables which were under 700 lb. tension prior to launching. The target was "pushed" by the launching car at a point just under the wing (*Continued on page* 44)

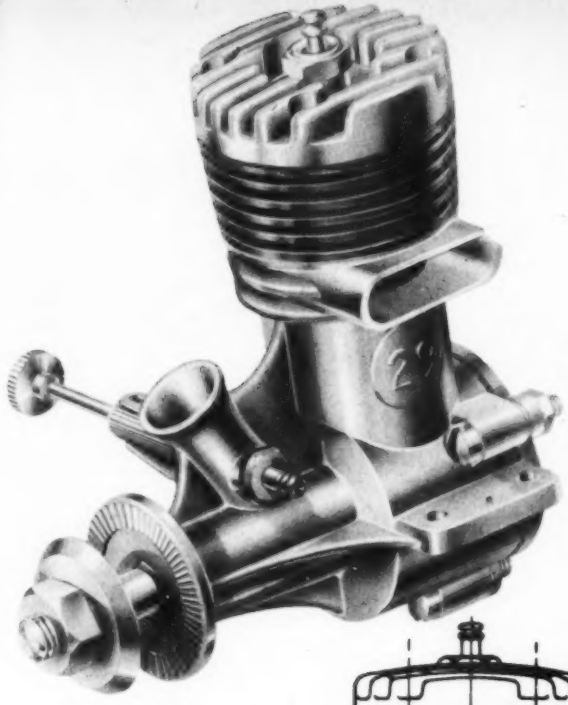


ENGINE REVIEW

▼

VECO .29

Designed to reduce break-in, power loss from overheating, test engine proves in unusual "tortured metal" runs durability under bad conditions.



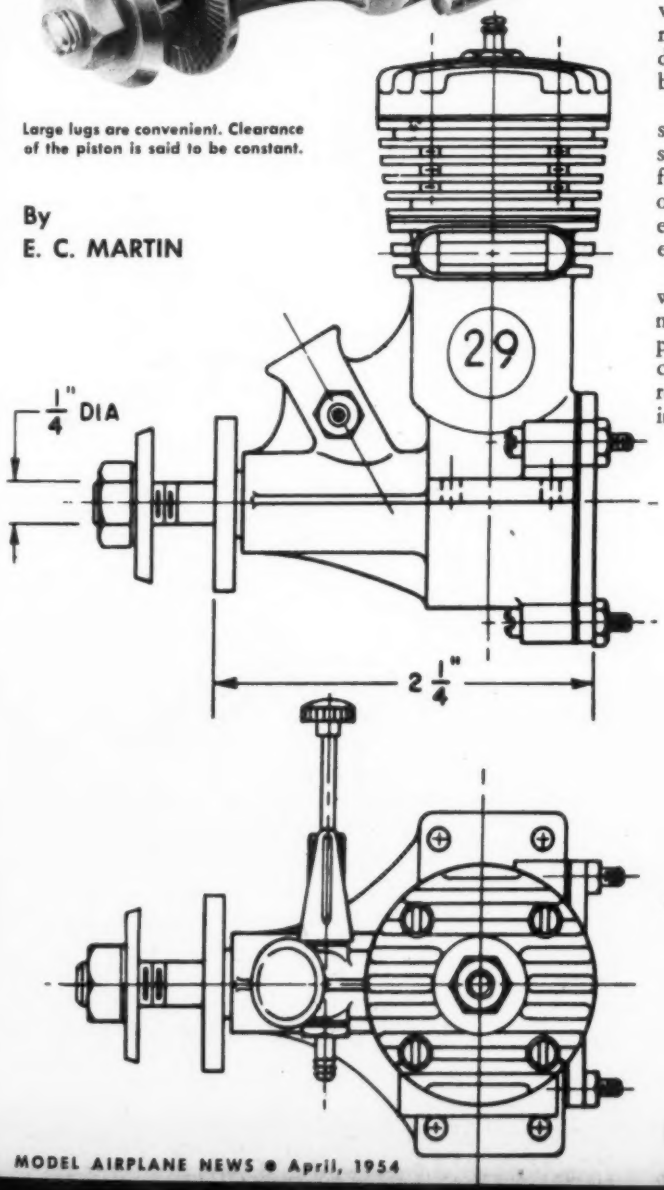
Large lugs are convenient. Clearance of the piston is said to be constant.

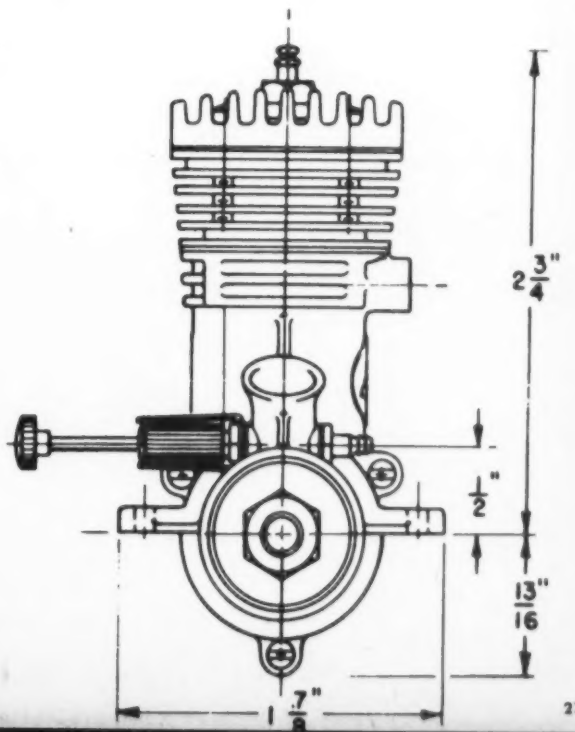
By
E. C. MARTIN

▶ During the past four years Veco .29 and .31 engines have earned the respect of modelers the world over, and most engine fans will be familiar with their capabilities and performance. The subject of this test is the latest and improved version of the same basic design in which the possibility of reducing break-in time and avoiding power loss under conditions of excessive heat has been carefully investigated and brought to reality.

The result is an engine which appears to be incapable of seizure under anything like normal operating conditions, and since the manufacturer, Henry Engineering Co., stresses the fact that piston clearance remains constant throughout the operating range, we made a point of subjecting the test engine, after completing the tests, to the severest heat generating conditions it could produce.

The cylinder and crankcase were accordingly wrapped with asbestos tape and a 6 oz. flywheel fitted. Forty per cent nitromethane fuel was put in a large tank, and suitable protective material placed in the vicinity of the engine in case of shrapnel. The starting cord was pulled and the removal of plug leads and dive for cover were accomplished in a rather lively manner. (*Continued on page* 40)





TESTOR CHEMICAL COMPANY

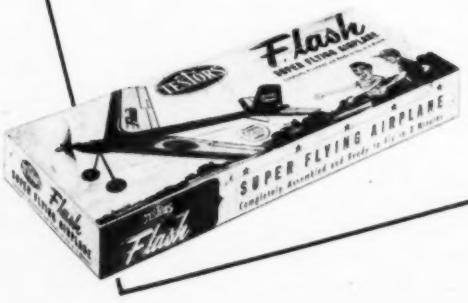
Proudly a

REVOLUTIONARY NEW PR F

TESTORS

Fla

INDIVIDUALLY PACKAGED IN COLORFUL BOX . . . COMPLETE WITH EASY ASSEMBLY AND FLYING INSTRUCTIONS.



- Wingspan
- Overall len 13"

Now! A fresh, new departure fr evious Look at the unmatched features: wings hi-thrust, wide-blade plastic prop . . uniq design appeal . . . far-superior fly erforma Testors "Flash" *exactly* what you en look hobby shop . . .

TESTOR CHEMICAL COMPANY (WOOD G DIVISI

ll Announces

R FAB FLYING SENSATION!

Flash

span
ll len 13"

79¢

re fr evious ideas in prefabricated flying models!
ures: wings like latest jets . . . specially designed
prop . . unique integrated assembly . . . irresistible
or fl erformance. Reasons a-plenty why you'll find
you b en looking for! Available now at your favorite

OOD G DIVISION) **ROCKFORD, ILL.**

UNMATCHED FEATURES!

ALL NEW CONCEPT in assembly (patent applied for).

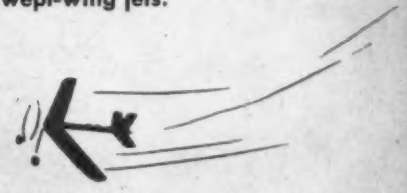
PLASTIC PROPELLER . . . latest wide-blade, hi-thrust, efficient type, specially designed for the "Flash".

POLYSTYRENE PLASTIC front fuselage unit and wheels in bright red . . . virtually unbreakable.

GENUINE T-56® RUBBER . . . contest quality! No compromises in making "Flash" the very best!

TESTORS QUALITY BALSA . . . velvet-smooth, uniform, the grade you expect from Testors. Colorfully printed in bright red; cleanly die-cut.

REAL PERFORMANCE! A rare combination of looks and eye-opening flying ability. Fast and stable, "Flash" emulates latest swept-wing jets.

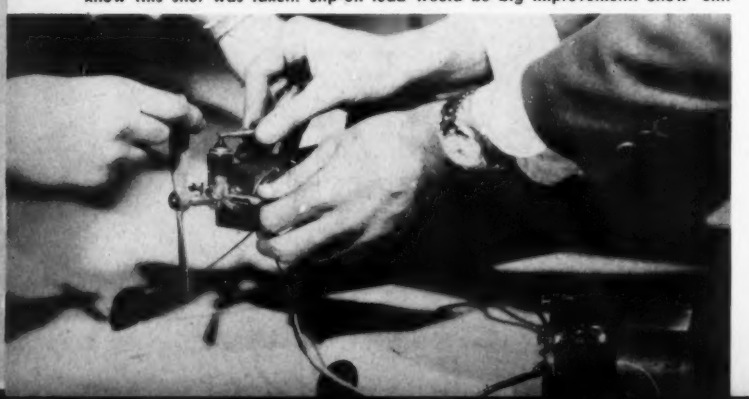


Engine bolts to plywood, cemented to fuselage front-side blocks strengthen assembly. Coiled tubing makes a substitute tank—but don't fill the engine with fuel.

UGLY DUCKLING

Can't claim that these ships cannot be broken—one got caught in a door. Glide pretty good, too, so don't send up high on a hot day. Use glider stock in wings.

Showing photographer, just for fun, how they start Cub on the field, boys didn't know this shot was taken. Slip-on lead would be big improvement. Show 'em!



Experts, bear with us! This one is for the younger fellows who are yelling for an easy free flight that flies and can't crack up.

This probably is the first model airplane to be published that does not have a designer. If, perhaps, the name suggests that the designer is really afraid to step forward, it should be remembered that the ugly duckling of the fable turned into a beautiful swan. This is the story of our ugly duckling.

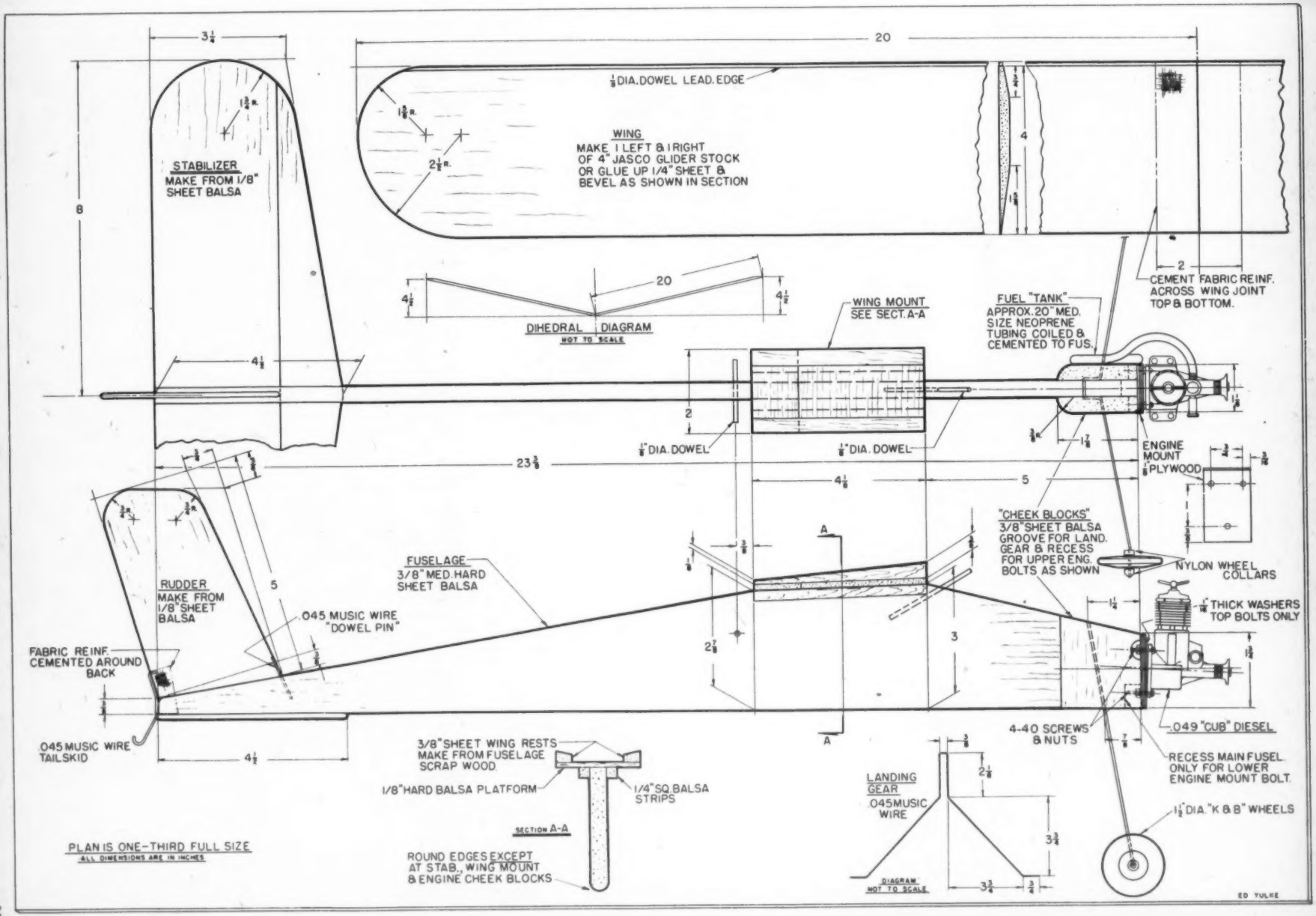
After the local junior flying circus had plumb wore out the valiant Veco Dakota—but not its Cub engine which still starts on a flip or two after six months of yeoman service—some suitable replacement was needed. This had to be something not a kit, for all new modelers should have a jam session whittling out their own pieces. The ship should require no design, be buildable by anyone strong enough to hold a pencil, and with the ability to push it, and it should fly. So, by rule of thumb, a lot of straight lines were put on pieces of wood and the small fry were told to cut here and don't come back until the pieces are cemented together.

Two of these junior birdmen immediately came up with finished airplanes—and not bad ones at that. Even color doped, one red and the other blue. If these ungainly looking ships didn't fly—incidentally, they look beautiful to a guy who has just made his first gassie!—well . . . But they flew, and flew well enough to replace the local Dakotas, in the boys' estimation. If the Dakota was designed to go in circles for safety, this "playing mantis," the Ugly Duckling, would go safely in any direction, right or left. If it wound, it would go around a complete circle wing tip just grazing the ground. A little trim tab on the fin is all that is needed to fly left or right.

The sizes are given on the plan. The plan isn't full size, fellows, because this is a pretty big ship to get full size on magazine pages and we don't want to make you younger fliers have to send away for a plan. The drawings are simple: the measurements are given and the lines are straight ones except for the stabilizer tips, which are circles. Use a compass or a bowl—heck, change the shape any way you want. Makes no dif!

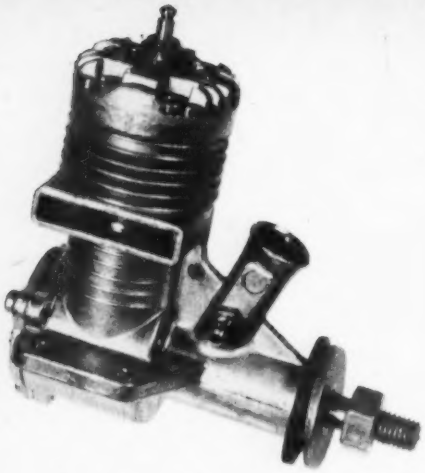
That thick slab of wood for the body came from Jasco. More popular sizes were not suitable for such a big .049 job. Other places stock these materials, too. The reason for the long thin wing is that it is made from standard 4-in. wide glider wing stock. All you have to do is sand down the sharp ridges with a sanding block, rubbing in the direction of the grain. If you can't get glider stock, work with 4-in. sheet—fairly soft stuff—and work it to shape with a sanding block using medium, then fine, paper. You don't have to put dowels along the leading edges but they do help protect the wood from nicks. The dowels are 1/8 in. Flatten the leading edge slightly, lay the wood on wax paper, and insert pins into the bench to hold the dowels in place while the cement dries. The gas tank should be a small one—ask your dealer—to avoid flying away. But neoprene fuel line tubing can be wound as shown in the picture.

Coil it up on the bench and color dope with fuelproof dope. When dry, cement to the fuselage side, holding in place with some pins. Cut off the heads and bend U-shape. Color dope over all. Run the engine rich and you'll barely have time to get the plane off for a short test flight. Leaned out, a normal flight results. Hand glide first, and jack up the front of the wing a little if nose heavy, or back of wing if tail heavy. END


STABILIZER
MAKE FROM 1/8" SHEET BALSA
WING
MAKE 1 LEFT & 1 RIGHT OF 4" JASCO GLIDER STOCK OR GLUE UP 1/4" SHEET & BEVEL AS SHOWN IN SECTION
1/8 DIA. DOWEL LEAD. EDGE
DIHEDRAL DIAGRAM
NOT TO SCALE
WING MOUNT SEE SECT. A-A
FUEL "TANK" APPROX. 20" MED. SIZE NEOPRENE TUBING COILED & CEMENTED TO FUS.
CEMENT FABRIC REINF. ACROSS WING JOINT TOP & BOTTOM.
1/8" DIA. DOWEL
1/8" DIA. DOWEL
ENGINE MOUNT 1/8" PLYWOOD
"CHEEK BLOCKS" 3/8" SHEET BALSA GROOVE FOR LAND. GEAR & RECESS FOR UPPER ENG. BOLTS AS SHOWN
NYLON WHEEL COLLARS
1/4" THICK WASHERS TOP BOLTS ONLY
FUSELAGE 3/8" MED. HARD SHEET BALSA
RUDDER MAKE FROM 1/8" SHEET BALSA
.045 MUSIC WIRE "DOWEL PIN"
FABRIC REINF. CEMENTED AROUND BACK
.045 MUSIC WIRE TAILSKID
4-40 SCREWS & NUTS
.049 "CUB" DIESEL
RECESS MAIN FUSEL. ONLY FOR LOWER ENGINE MOUNT BOLT.
3/8" SHEET WING RESTS MAKE FROM FUSELAGE SCRAP WOOD
1/8" HARD BALSA PLATFORM
1/4" SQ. BALSA STRIPS
SECTION A-A
ROUND EDGES EXCEPT AT STAB., WING MOUNT & ENGINE CHEEK BLOCKS
LANDING GEAR .045 MUSIC WIRE
DIAGRAM NOT TO SCALE
1 1/2" DIA. "K & B" WHEELS
PLAN IS ONE-THIRD FULL SIZE
ALL DIMENSIONS ARE IN INCHES
ED YULKE

Engine Review

FOX .19



Cylinder offset slightly to left, improving the timing cycle and reducing stress, friction, wear.

Crankcase casting makes provision for adding a double needle valve for two-speed operations.

by E. C. MARTIN

No scaled down .29 — .35, new .19 incorporates special features for improved performance.

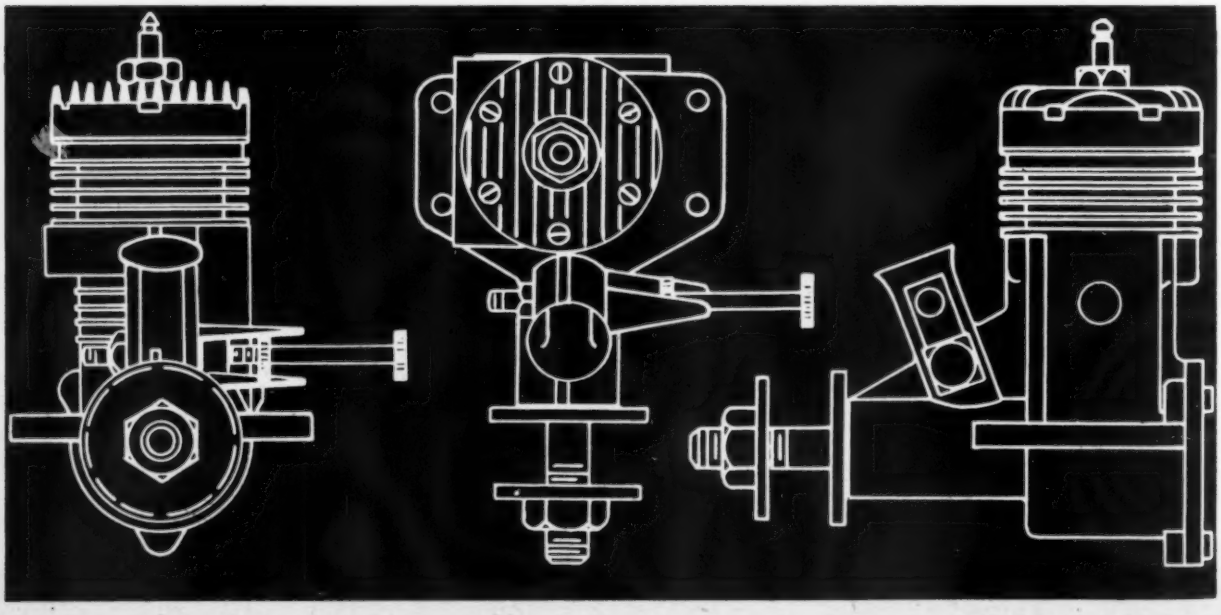
▸ Like most of those motors which appear, superficially, to be scaled-down versions of their predecessors, the Fox .19 looks neater and yet more rugged then the larger Fox engines, and performance and behavior do nothing to contradict this impression.

As a matter of interest to those who perhaps think that the development of a .19 from a successful and time-tested .29 is simply a matter of proportional mathematics, there is close to one year of experiment and frequent disappointment packed into the new Fox, quite apart from the previous knowledge and experience of the designer. The original engine with a center parting crankcase "did not," in the words of Duke M. Fox, "behave like a Fox... but I think we've got it this time." Looking toward the future, Fox is conducting long range experiments on piston baffle location and contour which will eventually confirm current beliefs or lead to a few more rpm. Either way, it is one more expensive step in the endless, often unappreciated, quest toward milking that cubic inch

The basic construction of this engine follows that of the .29 and .35 to the extent that assembly is identical. The main casting comprises the intake, main bearing, crankcase and cylinder barrel, including bypass passage and exhaust stack. The cast cylinder head and backplate are retained by Phillips head screws, and heavy four point beam mounts complete the similarity. Now to the differences that make all the difference.

Unique among domestic production engines is the use of the Desaxe cylinder arrangement whereby the cylinder center line is offset 1/16 in. toward the exhaust side (to the left looking from the front) in order to prolong the port opening period and improve the timing cycle without recourse to the use of larger ports with their low speed disadvantage. A secondary benefit lies in the fact that the conrod angle is appreciably smaller during the power stroke, which decreases side loading of the piston on the cylinder walls and, consequently, reduces power-consuming friction and wear.

The 1/16 in. offset also permits (*Continued on page* 53)



FLASH! News!

McDonnell F3H-1N Demon carrier fighter to be in production until 1956.

EDITOR'S NOTE

Although trade magazines give the specialist his aviation news, popular coverage has sunk to an all-time low. MAN, therefore, has begun regular full scale reporting.

By ROBERT McLARREN

Guided missiles, turboprops, parasite fighters among new exciting developments.

This year may well go down in aviation history as the "Guided Missile Year" since not one, but two, missiles are already scheduled to go into active defense service. The Douglas-built *Nike* is in vast quantity production and will be installed in batteries adjacent to our major targets, such as Washington, D.C. (where the first fully-manned battery is now being set up), New York City, Detroit, Los Angeles and Seattle. *Nike* is a rocket-powered surface-to-air anti-aircraft missile whose uncanny accuracy has been well-demonstrated in actual test. Now comes word that the Martin *Matador,* an atom bomb-carrying surface-to-surface jet-powered bombardment missile will be going overseas for batteries to be located in Germany. The big *Matador,* which is powered by an Allison J33 turbojet engine, is a high-speed, swept-wing bomber capable of delivering the atomic bomb on a target several hundred miles distant and of taking evasive action during its flight—all without a pilot aboard. Two B-61 *Matador* squadrons, trained at the Air Force Missile Center, Cocoa, Fla., will be sent to Germany this year.

Two-seat *Sabre* is being advanced by North American as solution to the problem of training *Sabre* pilots, who heretofore have had to take up their first *Sabre* all alone in the single-seat fighter. Known as the TF-86F, the two-seat version of the F-86F *Sabre* fighter is the fastest training plane in the world, with a top speed of more than 650 mph, a service ceiling of 45,000 ft. and a combat radius of 600 miles. It is powered by a General Electric J47-GE-27 turbojet engine of more than 5,800 lb. of thrust and weighs about 17,000 lb. The new TF-86F is the familiar *Sabre* jet fighter with a new 5 ft. fuselage section added to house the instructor. Armament has been reduced from six to only two .50-cal. machine guns for instruction purposes but a variety of navigational and communication equipment has been added. Not yet ordered for production, North American says the TF-86F could be built very cheaply since it would use existing jigs and tools now producing the single-seat fighter. (*Continued on page* 46)

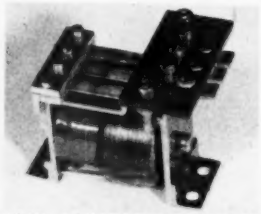
Now it's Mach 2, they are breaking—Bell X-1A, flown more than 1,600 mph. Below—Hamilton Standard fan, P & W turboprop engine, B-17.

GIVE YOUR PLANE A pactra "beauty treatments" with AeroGloss

RUBBING COMPOUND
a special, ultra-fine abrasive paste that imparts a mirror-smooth finish to all painted surfaces.
1¾ oz. can 40¢

HARD GLOSS WAX
genuine carnauba waxes and imported resins... Pactra-blended for easy application. Provides tough, durable, high-gloss protection.
1¾ oz. can 40¢

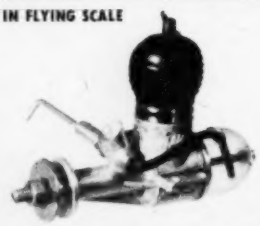
pactra Chemical Co.
MAKERS OF THE MOST COMPLETE LINE OF MODEL FINISHES
1213 N. Highland Ave., Los Angeles 38, Calif.



Lightweight miniature 3-Reed unit, weighs only 1 ounce. Also 1/2 ounce subminiature relays recommended for this unit. 5-Reed units built on special order.

PRICES:
3-reed unit.....$19.95 5-reed unit.....$24.95
relays, each.....$6.50
Send money order to:
RADIO CONTROL SPECIALTIES
377 West 8th Street • Eugene, Oregon

TOPS IN FLYING SCALE



The top engine for flying scale models from WW-1 fighters to ducted fan jets. Uses any prop from a 5/4 up to an 8/4. 6,000 to 13,000 RPM. Develops .042 bhp.
ENGINEERED TO LAST A MODELLING LIFETIME.
Allbon Dart II .033 Diesel—$7.95 pp.
34" Sabre Ducted Fan Jet Kit—$4.95 pp.
BILL'S MODELS
418 SPRUCE, N.E. • ALBUQUERQUE, NEW MEXICO

FOREIGN NOTES

A monthly world-wide round-up of technical developments, designs, significant industrial products.

by P. G. F. CHINN

VP Props for RC

Fred Borders, pioneer British radio control man and manufacturer of all-plastic crash-proof props, has remarkably effective variable pitch prop. Originally devised for a twin Forster 99 powered 11 ft. Douglas C.47, the design depends on centrifugal force to alter blade angle. Using two-speed timers, props drop to zero pitch at around 2,500 rpm, allowing realistic engine-on landings. Flexible plastic blades prevent damage should touchdown be too steep. These props not in production, however.

Light-Steering

Radio-controlled endurance contests – for example, RC soarers – may not be far off, but controlled or semi-controlled endurance flying is not new: the Swiss have their compass-steering models; the Germans have *lichtsteuerung* – steering by light. Light-steering dates back as far as 1937. In '38, a German national glider contest was won by Helmut Sinn who has conducted much experiment into this type of control. The gear, of course, is operated by sunlight through the medium of a light-sensitive cell and an electro magnet coupled to the rudder. Layout as follows:

Photo-electric element: This is a simple selenium coated cell and is fitted on swivel mount atop the fuselage so that it can be adjusted to face 90° to sun's rays when model is headed into wind, or in whatever direction it is required to move. To protect it, cell is covered by Plexiglas canopy or "astrodome."

Relay: Converted from 0.5 ma. milliammeter. Its purpose is merely to switch on the steering magnet on receipt of a small current in the same way that a radio receiver relay works the rudder escapement. In order that the cell may be adjusted to be effective only when exposed to direct sun rays, a small compensatory current is supplied via a battery and adjustable resistance.

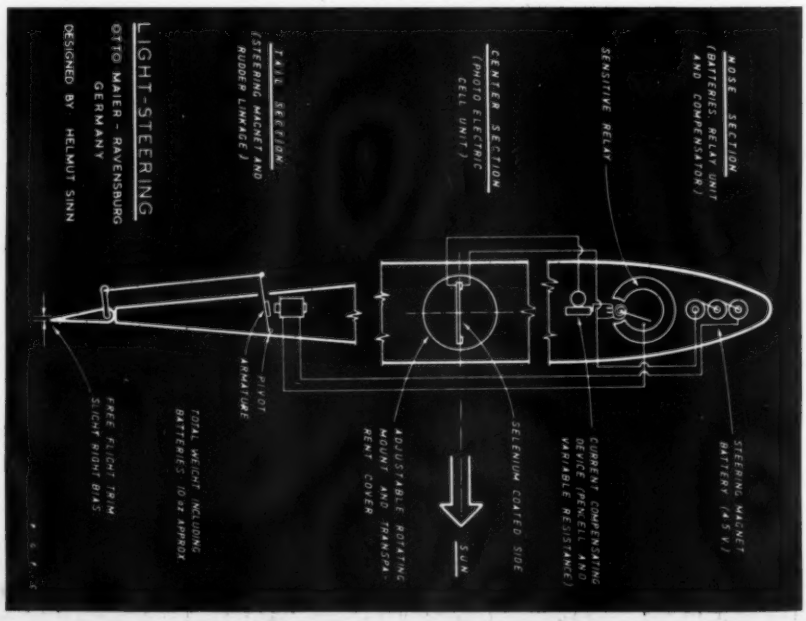
Steering Magnet: A simple electro magnet which is linked to a rudder horn and pulls the model into a left turn whenever current is received.

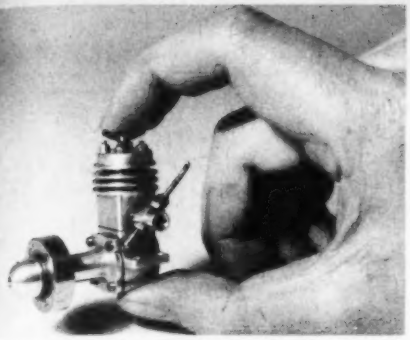
Flying Set-Up: Model is always trimmed to fly to the right. Assume that when flown into wind, sun is on the right. Selenium cell is therefore rotated until it is parallel with sun's rays and sensitive side is facing forward. Upon launching, model starts a gradual turn to the right, whereupon the sensitive side of the cell becomes increasingly exposed to sun's rays and eventually energizes relay which in turn trips the steering magnet and rudder pulls model back on course. In practice, the equipment can be adjusted so that steering magnet cuts in after a deviation of only a few degrees and model will maintain an almost straight course in this way.

Motors from Japan

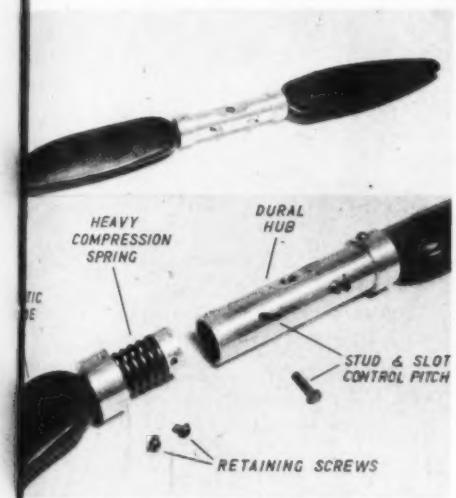
Japanese motor production, like that of the U.S., is concentrated on glow plug types. American influence is, in fact, more marked here than in most countries. Class A motors are made by Fuji (.099 cu. in.), Mamiya (.099), Hope (.19), O.S. (.099) and En-ya (.19). In Class B, there are the Fuji .29, the Mamiya .29 (also available in a disc-valve ball-bearing version), Hope .29, O.S. .29 (as

As early as 1938, German glider won contest using light steering. Model steers by sunlight.





Tiny hand-built Diesel, by R. G. Cameron of Scotland, is of only .008 cu. in. displacement.



The 14-inch Borders variable-pitch prop for RC, using Atwood, Cyclone, O & R 60, and so on.

imported into the U.S. by Bill Atwood) and En-ya .29, Big .60's are made by Mamiya and En-ya and a pulse-jet is put out by O.S. Fuji range also includes a Class C .35 and an .049, Japan's only Half-A at the present time. Latest addition and sole Japanese Diesel reported at present in production is .06 cu. in. O.S.

Metal Migs from Scotland

R. G. Cameron, Gatehouse-of-Fleet, Scotland, believes in original approach. A watchmaker, he builds tiny engines, model cars and unusual airplanes. His latest efforts in latter direction are two scale ducted-fan MIG-15's, one 29-in. for Cub .049 and one 12-in. for baby motors like the .008 cu. in. Diesel shown. Unusual point about these ships is that they are mostly of metal construction. Fuselages are formed entirely from sheet aluminum and riveted, there being 143 rivets in the fuselage of the bigger job. Wings have simple balsa frame and are sheeted with .009 aluminum. Both models have adjustable control surfaces which hold settings by means of rubber friction pads.

Tough Construction from Down Under

RC enthusiasts who like to bounce their ships and go right on flying will be interested in crashproofing kinks evolved by Peter Weaver of Queensland, Australia.

Many RC designs are apt to be weak around the cabin section and to combat this, Weaver substitutes 1/8 in. Plexiglas for the usual cabin window material. In addition, cabin is lined with thin aircraft-plywood. Result is an immense increase in strength and rigidity for only 2-3 oz. extra weight. This for existing designs: for originals, a new type

(*Continued on page* 38)

1954 ★ EXTRA ★ 1954

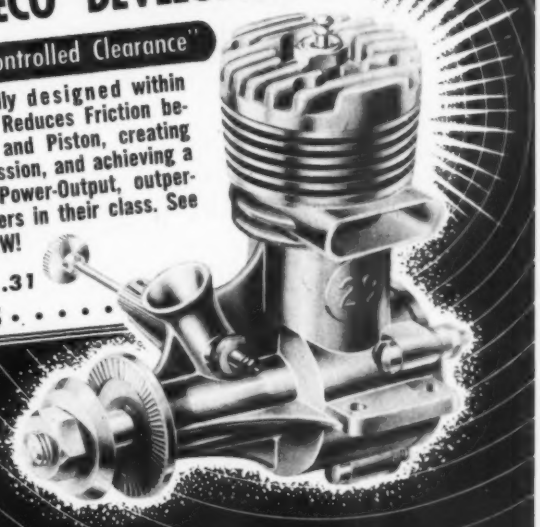
A NEW 'VECO' DEVELOPMENT

"Temperature Controlled Clearance"

Thermodynamically designed within 'VECO' Engines, Reduces Friction between Cylinder and Piston, creating Greater Compression, and achieving a New High for Power-Output, outperforming all others in their class. See Your Dealer NOW!

'VECO' .29 or .31

. . $14.95 . . . . .



VECO PRODUCTS

MAKE YOURS A 1954 MODEL

All parts are interchangeable with previous 'Veco' engines. Return your engine to the factory now and a small nominal fee converts your old engine regardless of condition.

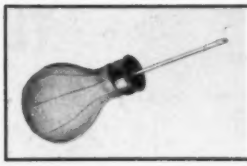
Send for 'Veco's' New Illustrated folder of 50 quality items for enjoyment in model aviation. Engines Airplanes Wheels and Accessories

Henry Engineering Co.

P. O. Box 229, Burbank, Calif.

STANDARD CONTROL LINES

Dia.	Length	List	Dia.	Length	List	Dia.	Length	List
.004	2-35'	.35	.014	2-52'	.60	.014	2-70'	.75
.006	2-52'	.50	.016	2-52'	.60	.016	2-70'	.75
.008	2-52'	.60	.008	2-70'	.75	.012	2-125'	1.00
.010	2-52'	.60	.010	2-70'	.75	.012 Jet wire		
.012	2-52'	.60	.012	2-70'	.75		1-100'	.25



Squeeze Bulb PUMP

2 oz. 59c 4 oz. 79c

Here's a foolproof, positive acting pump. Just squeeze the bulb and you're all set. Dentproof cap fits any standard fuel can. Corrosion-resistant tubing.

STANDARD FLEXIBLE LINES

Dia.	Length	List	Dia.	Length	List	Dia.	Length	List
.008	2-35'	.65	.015	2-70'	1.95	.018	2-85'	2.25
.012	2-35'	.95	.018	2-52'	1.50	Flexible Lead Cable		.25
.012	2-70'	1.95	.018	2-70'	1.95	Flexible Lead 1/2A		.15
.015	2-52'	1.50	.021	2-70'	2.15	Class A Race Car Cable		.65

INSTANT USE FLEXIBLE LINES

Dia.	Length	List	Dia.	Length	List
.008	2-26'	.85	.015	2-60'	2.00
.012	2-35'	1.25	.018	2-70'	2.00
.015	2-52'	1.85	.018	2-80'	2.30
			.021	2-70'	2.50

PYLON BRAND

OTHER PLYON BRAND ACCESSORIES

Self-locking Clips .....2 for 15c
Class A, B, or C Swivels.....2 for 15c
1/2A Nylon Handle.....37c

Sullivan Products

214 W. DAUPHIN STREET • PHILADELPHIA 2, PA.

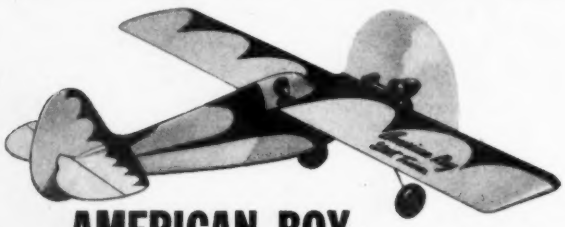
NEW!

PITT'S SPECIAL
LITTLE STINKER

SCOOP! Here's Betty Skelton's championship stunt flyer . . . never before at this low, low price. It's one of the snappiest, most colorful stunt flyers that ever took to the air. The completely prefabricated kit features: carved balsa fuselage, all the colorful decals, formd balsa wing, plastic pilot, Jim Walker's U-Control, etc., etc. — everything cut, formed or shaped for easy assembly, **2.50**

POWER WITH ANY SMALL BORE ENGINE (.020 TO .074)

SCIENTIFIC MODEL AIRPLANE COMPANY, 113 M4 MONROE STREET, NEWARK 5, NEW JERSEY



AMERICAN BOY

STUNT TRAINER

18" WINGSPAN FOR .020 TO .074 ENGINES

Here's our new, popular U-Control trainer . . . the biggest dollar's worth of model airplane in the whole wide world. It's a 100% complete — 100% prefabbed. BEGINNERS . . . Assemble it in "nothing flat," add your engine — and away you go! EXPERTS . . . you'll love this inexpensive profile job for your experimental work — for testing new flying techniques. **1.00**

NORTH AMERICAN
TEXAN AT6

18" WINGSPAN FOR .035 TO .074 ENGINES

An AIR TRAILS "Blue Ribbon" award model. It's our authentic scale replica of the world famous U. S. Air Force AT6 Trainer. The Navy calls it their "SNJ". Modelers everywhere call this exciting control-liner a real "thriller." The completely prefabricated kit includes: Jim Walker's U-Control, carved balsa fuselage, formed wing, cowling, etc. **1.95**

FREE Scientific Catalog . . . Contains all our exciting action models: Airplanes, Speedboats, Race Cars, Etc.

BOEING F4B-4 $2.95
SPAN: 17½" For .020 to .074 Eng. Deluxe U-Control model. 100% complete—100% prefabbed . . . with carved balsa fuselage, metal cowl, rubber wheels, pilot, etc.

LITTLE MERCURY $1.50
SPAN: 18" For .039 to .074 Eng. Carved fuselage model — at this sensational low price. It's completely prefabbed . . . easy to assemble, easy to fly. Jim Walker's U-Control.

CURTISS HAWK $2.95
SPAN: 17½" For .020 to .074 Eng. Deluxe U-Control model of the U.S. Army's famous "Hawk" fighter. 100% complete . . . 100% prefabbed. Contains carved balsa fuselage, etc., etc.

WACO CABIN $1.50
For .020 to .049 Engines
Imagine! This carved fuselage biplane "beauty" for only $1.50. It's semi-scale. Features Jim Walker's U-Control, all prefabricated parts.

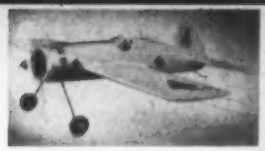
LITTLE MUSTANG $1
SPAN: 18" For .020 to .074
Famous escort fighter model. Completely prefabbed. Features balsa fuselage, formed balsa etc., etc.

LE DEVIL **$1.50**
18" For .020 to .074 Eng.
...nomically priced U-Control ... Easy to build and fun to ... Prefabbed parts include: ... balsa fuselage & wing, etc.

BUCKEYE JR. **$3.95**
LENGTH: 14" For .020 to .074 Eng.
Full speed ahead for thrills with this "beaut" of a speedboat. Prefabbed model is 100% complete—carved balsa hull, brass fittings.

RIVIERA **$3.50**
For "½ A" Eng., Electric Motors
Authentic Chris-Craft replica with a 12" carved balsa hull and brass metal fittings. All parts finished. Completely prefabbed model.

SEA HAWK **$2.50**
"½ A" Eng., CO_2, or Elec. Motors
Features our exclusive aeronautical fin and rudder design. Prefabbed model has a 12" carved balsa hull, brass metal fittings, etc.



BEL AIR **$2.95**
SPAN: 18" For .039 to .099 Eng.
Deluxe speed, sport & stunt flyer. Features carved balsa fuselage, formed hollow balsa wing, etc., etc. — all satin smooth finished. U-Control.

MONOCOUPE

18" WINGSPAN FOR .035 TO .074 ENGINES

Every beginner will love our scale model of America's favorite private plane. It's so easy to build . . . easy to fly! The prefab kit includes: carved balsa fuselage, formed metal cowling, Jim Walker's U-Control, etc., **1.50**

BOEING P-26A

18" WINGSPAN FOR .020 TO .074 ENGINES

Our popular P-26A . . . in honor of the U.S.A.F.'s first all metal pursuit plane. This highly colorful model brings to life all the beauty of the prototype. It's a terrific control-line stunt or sport flyer. The super-smooth prefab kit contains a carved balsa fuselage, formed metal drag ring, etc., etc. **2.95**

...ODELERS:
...E THESE SCIENTIFIC MODELS ... YOUR FAVORITE HOBBY SHOP
...o dealer is available, add 10¢ ...stage & packing) to cost of model

BE SPECIFIC SAY—

SCIENTIFIC

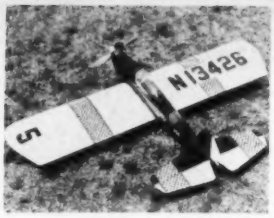
Mr. Stanley Ziemba, Jewett City, Conn., sent us this photo of his Scientific P-26A. Stan says: "... It's a beaut and flies like a dream."

NEW!

LITTLE BUCKEYE

You're in store for exciting action with this sleek speedboat. It's prefabbed for super-easy assembly. Just wait till you see it in action . . . it's positively sensational! Power it with any "½ A" engine, electric motor or Jetex. The big-value kit features a fully carved balsa hull, brass metal fittings, etc., etc. **1.95**

FLYING CIRCLES AVAILABLE



FLY 'EM WHERE YOU BUY 'EM

RICH'S HOBBYTOWNE, INC.

ROUTE 46

PARSIPPANY, N. J.

30 Minutes from Lincoln Tunnel via S-3 & 46

or from George Washington Bridge via 46

GRAND OPENING...APRIL 3rd

fuselage structure is used.

Briefly, this consists of a sheet crutch forming the bottom of the fuselage to which a full-width, full-depth plywood box forming the radio compartment is cemented. Bulkheads, landing gear, etc., are added, followed by two 1/16 in. sheet sides. These are primed with thinned cement and 2 in. wide strips of 1/16 in. sheet (also primed) are cemented on diagonally. After adding top, fuselage is covered with nylon. The pay-off? A practically indestructible fuselage.

Poland's Microfilm Models

Indoor jobs do not seem to have the following they enjoyed in pre-W.W. II days, but the U.S. is still leader in this field. Main reason for lack of support for microfilm modeling elsewhere is lack of good flying accommodations. Airship hangars and the like are now virtually non-existent outside the U.S.A. Nevertheless, most countries include indoor classifications in their records lists.

Among Polish indoor "names," we note Sylvester Kujava and Jan Bury of Poznan, Stanilaus Zurad of Krakov and Stefan Bombol of Warsaw. Zurad lately set a record of 6:18 using unusual type fuselage model. Wing (31 span, 178 area) is typical elliptical outline, but built-up microfilm covered fuselage is of deeply undercambered airfoil section profile with motor slung below, while stab is mounted on top of rudder. Microfilm covered prop is featured but, at 0.67 oz. total, ship is extremely heavy by our standards.

Nearer our ideas comes Bury's MIR-2, a parasole wing fuselage job of 30 in. span and 148 sq. in. Tail is carried on short boom and has underslung fin. Much lighter at 0.19 oz., ship is still at least twice as heavy as typical U.S. contest equivalents. Same builder also has stick tail-less job consisting of 127 sq. in. parasole mounted wing having 28° sweepback and elevon type upturned tips, a 12-in. motor stick and a pusher prop. This job scales 0.14 oz.

Western Trends in Yugoslavia

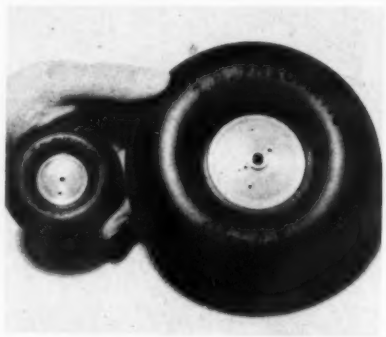
Among small Balkan states, modeling trends of Yugoslavia are distinguished by similarity to West rather than East. Yugoslavs have, by their own efforts, been well to the front on model matters (they provided World Glider Championship winners in '50 and '52), but when attention is paid to outside achievements, it is to America, Britain, etc., that they now turn. Industry is small. Motors used are mainly imported but home produced engines are also appearing. Included are two 1.5 c.c. (.09 cu. in.) Diesels, the Oskar 150 and Aero 150. Noted Yugoslav modelers Dragan Prohaska and Emil Fresl were responsible for the Oskar. It is a disc-valve job, has 12.5 x 12 mm. bore and stroke, 360° ports, beam mounts and weighs 3 oz. Aero 150 is a shaft-valve motor but otherwise of similar appearance, having annular ports and beam mounts.

Czechoslovakia vs. Hungary

Thus far, no Soviet satellite countries have entered official FAI competition in Europe, but 1953 did see at least one international event behind the Iron Curtain in the shape of a Czechoslovakia-Hungary meet. Czechs are good at the speed game and have landed more than one FAI record in these categories using motors of their own manufacture. Hungarians, on the other hand, use a variety of foreign makes among which we note American Doolings, French Microns and REA's, Italian Super-Tigres and Pennas rubbing shoulders with Russian AMM and Fillipchev designs. Czech jet man J. Sladky of Brno, who won national event, flew enclosed-jet metal-covered projectile at 149.13 mph.

Still No Channel Crossing

We wait to see whether that oft repeated promise—"I'm going to fly an RC across the English Channel"—will be fulfilled by anyone during 1954. No one has done it yet. The successful E.D.-sponsored model boat crossing by George Honnest-Redlich in 1952 (in which the model had an uneventful enough trip but the occupants of the following motor-boat did not) only served to emphasize the need of similar model reliability by solving, in advance, all the technical problems of piloting a model airplane across 20 miles of sea. END



Z. N. pneumatic wheels (England) in five sizes up to 6 in. Inflatable, extremely well made.

Tissue Happy

(*Continued from page* 21)

our models look "stock." Have a try at cutting your own model markings from black and other colored tissue. The cutting of this trim is much easier than it seems at first glance, and your models will have an original look that will draw them apart from the ordinary model in the hobby shop. It isn't necessary to be an artist to do a nice job with this technique. Naturally, be as neat as you can when drawing design marking to be cut. Keep it simple.

You can make your own club insignia from different colors of tissue, applying one color at a time. The lighter colors are put on the ship first. Dark colors are applied last, or on top of the lighter colored layers of tissue. All of these layers are applied to the model with soft brush and very thin clear dope. One coat of dope is enough to make each layer of tissue adhere to the already covered model surface. Allow each layer of the design to dry before brushing on the next layer of tissue. It is best to lay the design upon the model surface at desired location and brush the thin clear dope *through* the tissue from the top. When this last tip is used, the tissue design will not slip or wrinkle during application. The right time to apply these black or colored markings is after the surfaces have been given only one or two coats of dope. After markings are all in place, clear dope to the desired finish.

Tissue model decorations are more easily applied on models with translucent or clear doped coverings. However, black tissue markings can be applied over pigmented dope if it is done by a minimum of hasty, wet brush strokes using dope that has been extremely thinned.

Reasonable taste and judgment should be used when designing and placing model markings. Too, we can say that it is difficult to ruin a model's appearance by the use of black tissue, even if it is a case where the modeler did not know where to stop.

Nearly all of the bright and pastel colors that we use on models need a touch of black. Add this black trim in any manner best suited to the model. A touch of black on any model will help hold down our screaming bright colors to only a moderate roar.

If there be any secret, other than craftsmanship and color, in creating a model with good appearance, this secret may well be the clever use of black tissue trim. END

NEW BOOK

"RADIO CONTROL OF MODEL AIRCRAFT"

BY G. SOMMERHOFF

First of 3 new Radio Book series. Contains over 160 pages (about 50% more pages than past Radio titles that we have sold). Approx. 85,000 words in text, over 160 drawings & photos. Gives elementary course for beginners. For the expert with years of experience, book deals with complex work. (Many of the multi control units are PATENTED, however permission is given to use these units for personal use.) Units never before shown in magazines or other books. PLANS and SCHEMATICS (not just theory) are given for perfected units—3 different TRANSMITTERS, 4 RECEIVERS (hard tube & gas tube) including tone control. Layouts for 7 ESCAPEMENTS simple type may be constructed in one evening to complex type giving ENGINE, RUDDER & AILERON operation from one receiver without sequence. An escapement made from information could well be worth more than the PRICE OF THE BOOK. Make your own sensitive, ultra light weight Relay's from drawings, your own Field Strength Meter, Multi range test meter all are shown. Charts telling how to figure Queach coil values, how to figure slug tuned form windings, Wire resistance tables, etc. For those owning Commercially made Radio units, or those working from kits a full trouble shooting section is given, this information may save you the cost of a tube or Crystal, this alone would be worth price of the book. Boat or Auto's may be controlled also with above units. We cannot tell all of contents in our small ad, why not send NOW, 10 day money back guarantee.

OVER 160 PAGES! 85,000 WORDS! CLOTH BOUND! COMPLETE SCHEMATICS! PATENTED MULTI CONTROLS!

$3.98—MONEY BACK IF NOT SATISFIED

FREE With every a set of plans to build book purchase Good Brothers radio model we will send . "RUDDER BUG"

ALSO AVAILABLE NEW 1953-54 AEROMODELLER ANNUAL—$2.98

Print name & address in column this ad, check items you wish & add 10c per book for postage. Remit with order. Send 25c for plan & book catalogue. Year subscription "AEROMODELLER" $4.50 sample FREE with cat.

GULL MODEL AIRPLANE CO. 10 EAST OVERLEA AVE. DEPT. M BALTIMORE 6, MARYLAND

MAN at Work

(*Continued from page* 8)

invite mike enthusiasts to meetings . . . Grand Rapids Model Club (S & S Hobby Shop, 1836 S. Division, Grand Rapids, Mich.) interested inter-club contests other groups in area . . . Herb Davis, well known Birmingham, Ala., speed flier, with younger brother Al, who is doing good job of following in Herb's footsteps, have speed pans for all classes. You can be sure these boys know what you need. New Half-A pan, for example, has web to take the newest of the hot Half-A engines. Illustrated info sheet, Davis Brothers Products Co., 506 Hampton Drive, Birmingham, Ala. One hundred and fifty—count 'em—Exchange Clubs in California, planning an AAA regional meet to be known as California Model Airplane Championships. Two days, May 29th and 30th, at U.S. Marine Corps Air Facility Base, Santa Ana. All classes. Info from L. E. Montgomery, 449 W. Manchester, Inglewood, Calif. Support it, boys; there's more contests where it came from. END

Should We Scrap Microfilm?

(*Continued from page* 17)

often have recessed light fixtures.

The new class would be a wide open class. No restrictions except 100 sq. in. of wing area, and paper covering. Ruling out microfilm will be like the ruling out of oxygen and thin flying wires on controlline speed models. Sure, without restricting the controlline models, the speeds would have been up to 200 mph; but without the sensible equalizing rules, only three or four fliers would still be interested in speed controlline flying.

I definitely don't suggest adding *another* class of indoor models. The new paper-covered class is to be in place of both indoor cabin and stick. One new indoor class, that *all* can build and fly, will receive the focus and effort of all fliers—like PAA revitalized free flight gas with cargo work. Adding another class of indoor models won't help at all; the whole indoor rubber rule set-up must be changed. Another class will just clog the confused AMA contest morass even more.

Beginners believe that microfilm is difficult to make, requires careful handling and transporting, and is impossible to patch. Experts say no, that microfilm is easy to use—even easier than paper—but it is obvious that new modelers don't take kindly to "pouring film."

The paper-covered models are heavier all around, easier to build and simpler to transport. The 100 sq. in. models can be packed in a small box.

Let's prorate flying times made in buildings of different height to allow a national record — and nation-wide competition — in a site from 25 to 160 ft. high. The best microfilm times in different ceilinged buildings (from memory and old *Yearbooks*) were plotted on a graph (Fig. 1). Then taking the best possible time (judged from actual flying) of paper-covered models—20 minutes in 100 feet—a lower line was plotted on the graph following the microfilm curve.

All the flight times would be corrected to an 80 ft. ceiling. Twenty-three and one-half minutes in 140 ft. building multiplied by the coefficient .745 gives 17-1/2 minutes corrected time. Likewise, 7-1/2 minutes in a 30 ft. ceiling multiplied by 1.92 gives 17-1/2 minutes corrected time.

The chart isn't perfect. It will have to be corrected from time to time in view of experience with the new class, but national competition can be stimulated and indoor flying can be raised to a practical level of flying, where *something is done.*

Little groups all over the country can fly in whatever building is available and still have a chance to set a record and fly against the experts *and become experts.*

Most potential indoor builders have handled tissue and feel some familiarity in building a paper-covered model. Paper covering gets past the mental block of microfilm making and especially appeals to the novice. The national magazines have patiently described the techniques of making microfilm (detailed pictures, prosy paragraphs) for years; few new indoor modelers have been born. Why? To interest modelers in a new class of flying, it must be proven challenging and have a potential of active competition—like PAA events, for instance. {Perhaps with a little spirited leadership a sponsor can be found for the paper-covered class.} The place where indoor falls flat is the potential of active competition: there is no place to fly 25-30 minute microfilm models, save the naval air docks at Lakehurst or Santa Ana.

I have solicited opinions from 11 top indoor builders. Not everyone agreed 100 per cent with my suggestions. But all favored either substituting a paper-covered class for *all* microfilm (Roth's idea) or dropping indoor cabin and putting a paper-covered class in its place.

Said Carl Rambo: "Cabins are difficult to build, hard to ROG, a terror to wind, and in actuality are only a stick model modified to squeeze by the cabin rules.

"I'm willing to see cabin go," said Carl, "but I think we should have: (1) a paper-covered class and (2) a film class for the beginner to graduate to.

"The prorated ceiling idea is good but the graph will have to be carefully worked out."

What about these paper-covered models? Do they fly? How much do they weigh?

The Oakland Cloud Dusters have had a series of meets for 100 sq. in. paper-covered models. All kinds of planes have shown up, from a 35¢ TASCO ROG to a fully braced ship with the most advanced design (hollow motor stick, hollow boom, bracing, single spar built-up propeller, etc.). Top time to date in 100 ft. obstructed ceiling is 14:45. In a 25 ft. ceiling, top time is 5:25. The models weigh from .070 oz. (double that of a 150 sq. in. microfilm model) to 3/8 oz. for a Junior ROG.

And the third Oakland Cloud Duster meet found brand new indoor builders, those who had never built an indoor rubber model, competing. They felt they had a chance to build these sturdier ships and fly frequently in a local school auditorium with a fair chance of success, even though the film experts still won (frequent comment: "Wait 'til the next meet, now that I know what this indoor business is about.")

The new class can liven the stagnated indoor flying. By broadening the base (smaller ships which can be flown in more places) and having more ships to fly (easier for beginners to build tissue-covered ships) and equalizing the flying sites (adjust flying times to 80 ft. ceiling times), we can pump life into the defunct indoor class. This will not cheapen the wonderful achievements of the 30 minute microfilm modelers, but, by letting more modelers enjoy the thrill of indoor flight, will spread the science and development of inside flying. Who knows how long it might be until a 30 minute flight with a paper-covered model is accomplished? Experiments with stripping black rubber indicate full equality with pre-war rubber.

Purists will shout that pure flying technique and unrestrained development are important, but it is prudent to push that progress into channels that will allow widespread flying and enjoyment, just as midget racing cars are popular because they are within the means of many racing drivers who only curiously read about Sir Malcom Campbell's 301 mph—and $100,000—racing speedster. END

DEALERS!

Send for a free sample Copy of the hobby industry's leading trade magazine.

Packed full of information designed to help you sell more hobby merchandise.

CRAFT, MODEL & HOBBY INDUSTRY

30 E. 29th St. New York 16

DON'T WORRY!
I used the NEW CLEVELAND MODEL Cement
containing "STATISEAL" (TM)
Miraculous Super-Grip Adhesive
At Better Hobby Shops Everywhere!
CLEVELAND MODEL PRODUCTS CO.
SINCE 1910 CLEVELAND 2, OHIO

"I'll take GOLD SEAL every time!"

says WILLIAM M. WHITE, Jr., 1953 Grand National Champion

"The Nationals are a mighty important tournament and even though I had my choice of many fuels, I used Gold Seal as I always do . . . I knew my engine would perform at its peak! Ya' know, model builders all over the country who want the best performance possible are switching to Gold Seal . . . Why don't you?"

OHLSSON MFG. CO.
1547 West Sixteenth Street
Long Beach 13, California

YOU JUST KNOW YOU CAN BUILD and FLY . . .

TOP FLITE

JIGTIMES

- ALL PARTS DIE-CUT!
- READY TO ASSEMBLE!
- NO TOOLS NEEDED!
- GUARANTEED TO FLY!

25¢ JIGTIME JETS

"Catapult" these Jets with powerful rubber band supplied with kit.

59¢ JIGTIMES

2 color, propeller-driven, beautiful flyers. Most have 18" wingspans.

$1.50 JIGTIME "LIL RASCAL"

FREE-FLIGHT and/or CONTROL LINE

FOR ½A ENGINES

The ideal "first" gas-powered kit. Famous JIGTIME design makes it easy to build—a "honey" to fly.

SEE THEM AT YOUR HOBBY DEALER

If not available—write:

TOP FLITE MODELS INC.

2635 S. Wabash Ave., Chicago 16, Ill.

Veco .29

(*Continued from page 27*)

The berserk scream lasted perhaps two minutes, became disjointed and stopped suddenly. Upon venturing forth it was found that the fuel was boiling merrily in the delivery tube which was close to melting where it contacted the spraybar, and the plug filament had disappeared. Having repeated this destruction test four times, it can only be said that the Veco can stand more than flesh and blood, because subsequent examination indicated no signs of stress or galling marks on either the piston or bore.

While the foregoing is not our regular practice, we can say, for what it is worth, that this is the first lapped piston engine in our experience that did not partially seize under similar conditions.

During stunt flying with the old Veco engine we have frequently experienced a bad power loss during hot weather, and even after a considerable amount of use and with a high oil content, the tendency never entirely disappeared. Many readers will, doubtless, have had the same experience, and may therefore be interested in the facts leading to this considerable improvement.

Apparently, when heated to 425°F, the piston was found to expand .0003 in. more than the cylinder bore. Since the diametric clearance at room temperature in a new engine was only .0002 in., the inevitable result of overheating was seizure unless the engine had been thoroughly broken in.

The design of the old cylinder embodied fins machined integrally with the steel barrel which apparently limited the circumferential expansion of the bore. Upon removal of the fins it was found that bore and piston clearance remained identical from room temperature up to 425°F and the production engine is therefore fitted with a flanged drop-in type liner which is a slip fit in a separate aluminum finned sleeve. An important benefit arising from this is the successful employment of smaller piston clearances in the new engines. This means better compression, cleaner running, easier starting and longer life. General construction of the Veco is very robust, and compared with the short stroke racing engines of similar displacement, the appearance suggests brute pulling power rather than astronomical rpm. With almost identical bore and stroke of .725 and .724 in. respectively, and somewhat conservative gas passages and porting, the performance is, in fact, outstanding on big props while still being quite useful on the small stuff.

From flying experience with the older version in which the factors governing performance were the same as in the test engine, the Veco .29 and its larger bored companion, the .31, can be thoroughly recommended for stunt, combat and radio applications, especially if prop dimensions are selected which confine rpm between 11-12,000 which is where smoothest running occurs.

A meehanite main bearing bushing of very fine surface finish is pressure die cast in position in the aluminum crankcase and projects inward slightly to provide a thrust bearing for the crankdisc. This bearing material is renowned for its good wearing properties and low friction under adverse lubrication conditions, and its high tensile strength has enabled its use for full sized crankshafts in the form of castings, with a considerable saving in cost compared with steel drop forgings.

Sturdy four point beam and three point radial mounting lugs, bypass passage, exhaust stack and forward raked intake are incorporated in the casting, and all stress points are strengthened with large webs.

The cast aluminum rear cover is retained by nuts and bolts through the radial mounting lugs with a heavy composition gasket between the joint.

The steel crankshaft, machined from bar, with all rotating mass balanced by a crescent type counterweight, has a beautifully ground 3/8 in. diameter mainshaft with 1/4 in. dia. gas passage and large rectangular valve port which gives fairly "hot" timing with early opening and late closing. A 7/32 in. dia. hollow crankpin with a nicely machined surface receives the drop forged aluminum conrod, which, in order for the shank to clear the revolving counterweight and to save making the crankpin longer than necessary, and thus undesirably increase crankcase volume, has an offset big end bearing. The wrist pin bearing is 5/32 in. dia. and a full 3/8 in. long, and embraces a ground tubular wrist pin with brass end pads.

Meehanite is again employed for the piston which is machined all over and has a long skirt with the wrist pin bearings centered 5/64 in. above the mid-length position, so that the thickened portion of the skirt necessary for bearing support is correspondingly shortened, with a consequent saving of reciprocating weight. An internal lip is left at the bottom of the skirt to help prevent distortion and is probably also used for location during machining.

An excellent feature of this piston is the way in which the skirt is relieved. Instead of the conventional method of reducing the skirt diameter from the mid-length downward, the Veco piston has a fitted portion of about one third of the skirt length at the top, and a further 1/16 in. at the bottom, with a slightly reduced diameter between. This arrangement offers reduced drag while retaining the guiding effect of a fully fitting skirt. A nicely filleted straight baffle matches the bypass port length exactly, but seems unusually shallow, since the bypass port is partially visible through the exhaust at bdc.

The steel cylinder liner is similar in appearance to the type used in racing engines, and were it not for the fin portion being separate from the crankcase, the set-up would be identical. The 120° exhaust and bypass ports, while not being long circumferentially, are 3/16 in. wide, giving early opening and late closing. Wall thickness of the liner is a full 1/16 in., which is a contributing factor to the engine's stamina on a flywheel.

The aluminum fin sleeve, produced by die casting, slides onto the liner and features a recess to receive the liner flange. Gaskets then seat on either face for the cylinder head at one end and the crankcase flange at the other. Four bolts extend through holes in head and fin sleeve to screw into tapped holes in the crankcase flange.

Another aluminum pressure die casting, polished by tumbling, comprises the head. Deep fins, with plenty of wrench clearance around the center plug hole, have an efficient and attractive appearance. The combustion chamber shape is a truncated hemisphere, divided by a recess for piston clearance, and dimensioned so that the short reach plug screws in exactly flush with the polished surface.

Spraybar design is conventional and executed in brass, having barb shaped fuel line pressure rings, and external threads for control knob to provide easy adjustment and clamping nut and brass ratchet sleeve. The tapered needle is pressed through the ratchet sleeve and terminates in a knurled aluminum control knob to provide easy adjustment and ample finger clearance. A two pawl spring, clamped by the spraybar nut, engages with the ratchet.

Drive is conveyed to the prop by a sturdy cadmium plated steel prop driver which is keyed to the shaft by a flat sided broaching and butts up against a shoulder where the shaft steps down for the 1/4 in. steel prop

THE BEST DEAL YET!

WE'RE OFFERING EXTRA-GENEROUS TRADE-IN ALLOWANCES!

MODEL F-29 or F-31
$11.20

To clear the flying fields of worn out, balky old engines—to give thousands of modelers a fresh start with a top quality engine, we make this sensational offer:

Mail your old engine to us, no matter what make, size or condition, even though some parts are missing! We will allow you $5.00 for it in trade towards a brand new FORSTER front rotary valve engine. Your old engine and only $6.20 will bring you the latest and best model F-29 or F-31 FORSTER engine, made by the oldest established model engine manufacturer in the U.S.A. and known the world over for outstanding precision, performance and fuel economy.

This is a limited offer, good at the factory only! Mail us your old engine today. The new engine of your choice will be on its way to you promptly. Write us for free descriptive literature.

it's trade-in time for a better deal!

YOUR ENGINE IS WORTH MORE ON A NEW "FORSTER"—NOW!

FORSTER BROTHERS, 7 E. Lanark Ave., LANARK, ILL.

nut. A 1/16 in. thick cadmium plated steel washer completes the assembly.

A 9/16 in. long aluminum shaft extension assembly, with aluminum sleeve nut and steel washer, is now available for both Veco engines, priced at 75¢, and is capable of taking props from 5/16 to 5/8 in. thick. Unlike many extensions it runs dead true and is sturdily designed. The sleeve nut is tapped throughout its length with a tapered entry at its outer end to facilitate spinner attachment.

On test the Veco behaved normally with no vices whatever. Needle control was ideal, starting excellently, both hot and cold, without priming, and firing smooth and regular at all tested speeds. There was no period of roughness at any speed but smoothest running was obtained between 11-12,000 rpm, where it left nothing to be desired.

Test: Veco .29

Plug: Anderson, as fitted; 1 1/2 volts to start; Fuel: Supersonic 1000; Running Time Prior to Test: 1/2 hours; Bore: .725 in; Stroke: .724 in.; Weight: 7 1/4 oz.

Power Prop	*RPM*
10 x 8	11,000
10 x 6	11,900
9 x 8	12,100
9 x 6	13,200
8 x 8	13,400
8 x 6	14,000
7 x 10 1/2	13,300
7 x 9	13,700
7 x 8	14,000
Top Flite	
10 x 8	10,100
10 x 6	11,050
9 x 8	11,200
9 x 6	12,000
8 x 8	12,300
8 x 6	13,000

END

High Diver

(Continued from page 23)

But a number of power tests finally were made, the first several of which, engine running rich, seemed even more distressing. But given enough power, the ship unexpectedly looked very good indeed.

The first hurdle in operating this kind of airplane is to forget pre-conceived notions about angular difference. The High Diver has 1/2° difference between wing and stabilizer incidence, and is longitudinally stable, whereas ordinary airfoil set-ups often exhibit a tendency to build up stalls with low angular differences. Increasing the angular difference with the 2412 decreased stability rapidly. This airfoil has a full scale type of stall: Slow the ship up enough and a panel will stall sharply, despite washout, and, as the wing tip falls, the plane goes into true spin rotation!

Therefore, (at this wingloading), the plane requires a fast, clean glide, and good flying speed at all times. DeBolt advised that his early symmetrical jobs would spin, defying recovery, even with elevator and rudder, when 3° decalage was reached, though a slight forward shift in CG had beneficial effects. Improperly thrown, or when out of trim, the test glide may actually fly over the top, nosing down in an arc, like a free flight job with too much angle in the stab. Nevertheless, this did not show up during 38 test flights, including plenty of tucked-under dives; recovery is sharp from any position. A minute increase in downthrust will cause a nose-down tendency after launching. The plane is sensitive to thrust adjustments.

Banked slightly, the ship will rock out, but overbank, and it will continue in the direction you left it until taken out with opposite rudder. When you get used to this characteristic, you can start a turn, release the button, and

DEALERS!

Send for a free sample Copy of the hobby industry's leading trade magazine.

Packed full of information designed to help you sell more hobby merchandise.

CRAFT, MODEL & HOBBY INDUSTRY

30 E. 29th St. New York 16

Douglas Super-6
CLIPPER
for desk or shelf . .
1/6" to 1' wingspan: 13" length: 11½"
Realistic wood model with display stand, full-color decals. Parts ready-shaped for quick assembly. Complete, $1.79 at your Hobby Dealer or send for free catalog.
STROMBECK-BECKER MFG. CO. Moline, Illinois, Dept. MN-4
StromBecKer

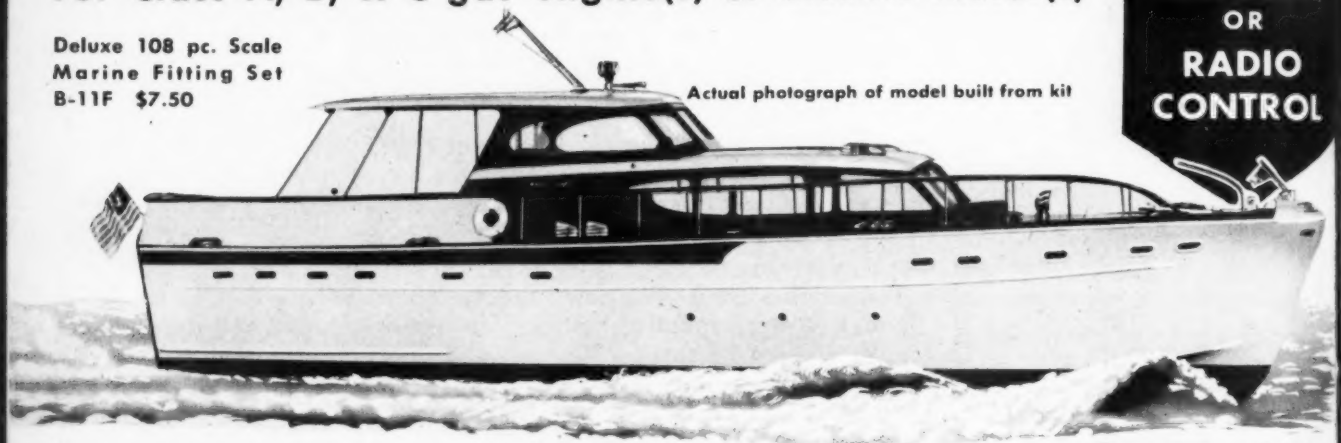
THIS IS

LUXURIOUS CHRIS-CRAFT 63' MOTOR YACHT

For Class A, B, & C gas engine(s) or electric motor(s)

FOR POWER OPERATION, SHELF MODEL OR **RADIO CONTROL**

Deluxe 108 pc. Scale Marine Fitting Set B-11F $7.50



Actual photograph of model built from kit

Entire cabin and rear deck instantly removable. Internotched and self-aligning construction. Die-cut African mahogany parts exactly as used on full-sized craft. Die-cut and embossed Gaboon mahogany simulated teak decks. Die-cut balsa frame members, etc. Die-cut plywood fire wall and motor mount bulkheads. Hardwood motor mount. Authentic decals. Reed molding. Wire. Yachting Ensign. Plastic for cabin windows. Venetian blind material. Complete set of port holes. Aluminum deck hatches. Material for canvas skirt. Marine power hardware including shaft, stuffing box, NYLON PROPELLER, brass rudder, nuts, bolts, etc. etc.

$18.95

Kit B-11M
Length 40" Beam 10¼"

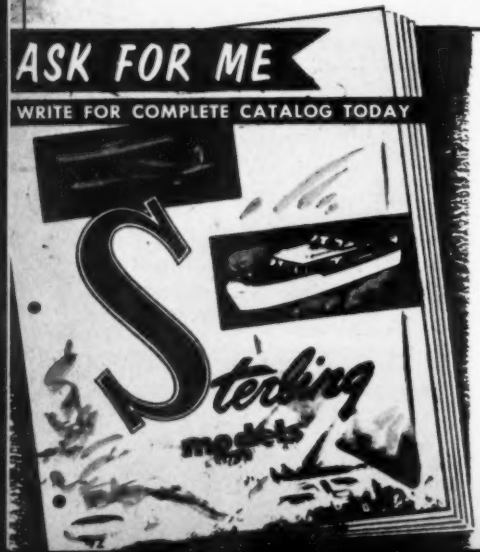
SEE THESE OTHER STERLING MODELS

PLANES	KIT	PRICE
Monocoupe	C-1	$4.95
Howard Pete	C-2	5.95
Mr. Mulligan	C-3	4.95
Waco	C-4	5.95
Polish Fighter	C-5	5.95
SE 5	C-6	5.95
Ryan S-T	C-7	5.95
Fokker D-VII	C-8	5.95
Ring Master	S-1	2.95
F-51 Mustang	S-2	2.95
Yak-9	S-3	2.95
Space Master, Jr.	S-4	2.25
R. C. Piper Tri-Pacer	FS-1	10.95

POWER BOATS	KIT	PRICE
Richardson 27' Cruiser	B-1	$5.95
Higgins 17' Speedster	B-2	4.95
Chris-Craft 47' Buccaneer	B-3	7.95
Century Resorter '20'	B-4	3.25
Century Sea Maid '20'	B-5	2.95
Chris-Craft 32' Cruiser	B-6M	9.95
Deluxe 34-pc. scale marine fitting set for Kit B-6M	B-6F	3.50
Chris-Craft 50' Catalina	B-7M	11.95
Deluxe 66-pc. scale marine fitting set for Kit B-7M	B-7F	4.95
Century Sea Maid '20'	B-8M	7.95
Deluxe 35-pc. scale marine fitting set for Kit B-8M	B-8F	3.95
Higgins 26' Express Cruiser	B-9	3.95
Harco '40' Deluxe Cabin Cruiser	B-10M	10.95
Deluxe 64-pc. scale marine fitting set for Kit B-10M	B-10F	4.50

MARINE DRIVES	PRICE
½ A (⅛" dia.) Gas Marine Drive	$2.95
A (⅜" dia.) Gas Marine Drive	3.95
BC (¼" dia.) Gas Marine Drive	3.95
Electric Marine Drive	2.25

Marine Fittings Also Available Individually. Ask Your Dealer.



the plane will complete a 360 by itself. Coming back into the wind, it will not balloon, nosing up very slightly as ground speed falls off. But it keeps boring along. Despite the theory boys, the convex section appears to stall sooner than the flat bottomed jobs, but slight stalls to regain flying speed are common on low powered planes, big or little, and 3-3/4 lb. is a lot for a .15 when flying nose high. A .19, here, would pull the ship on through.

The 2412 airfoil will allow the plane to tuck under in a dive, and continue on past the point where the flat bottomed jobs straighten out into a high speed inverted dive. Narrow chord flippers, as on the Acrobat, permit vertical fast dives and continuous loops as long as the button is held, but there is no chance of forcing the ship around an outside corner. With fairly large flipper movement, the High Diver will tuck under, going vertical within 10 ft., beginning to go under at about 25-35 ft., and onto its back, but at a 45° angle to the ground. The nose may hunt up and down as real high speeds are attained, while the engine runs away. Increased elevator movement decreased this angle to the ground, made smooth the dive path, but did not quite attain to the horizontal inverted.

The difficulty with escapement elevators is the all-or-nothing position. Large area and elevation movement produce abrupt dives, etc., but make pull-outs so tight that loads result in a high speed stall, like a ukie with too small a stunt wing, and an oval loop results. The dive should be barely established, then the nose allowed to rise for the loop, being pulled over the top at last with up-elevator. Pretty flying would result with small movement, but violent stuff cannot be done. A trimmable tail, possibly with servos, would allow realization of both conditions.

Though possessed of a more or less normal glide, the High Diver is not a floater. It reaches out and covers a great deal of distance, which calls for special handling in hitting a spot. Unfortunately, any playing around with

IT!

2 GREAT NEW AUTHENTIC SCALE MODELS—COMPLETELY PREFABBED!

Yours—to build and command—the fabulous Queen of the Fleet, the luxurious Chris-Craft 63' Motor Yacht—and the world-famous U.S. Navy carrier fighter, the incomparable CORSAIR! Both of these outstanding additions to the Sterling line are completely prefabbed, authentic in every detail, and painstakingly engineered for easy construction! Giant, step-by-step, easy-to-read drawings and instructions are included. Both kits at your dealer's now. Get yours today!

CHANCE-VOUGHT

CORSAIR

F4U-1, U.S. NAVY CARRIER FIGHTER SPECIALLY DESIGNED FOR U.S. NAVY CARRIER EVENT FLYING!

Kit C-9
Span 36"
Length 27¾"
$5.95
For Class B & C Engines

SCALE CONTROL LINE MODEL!

Die-cut balsa ribs, bulkheads, tail surfaces, deck, etc. Die-cut plywood parts. Leading edges completely gull-shaped, tapered and notched. Shaped and notched trailing edges. Authentic decal insignia. Formed wire landing gear. Gas model silkspan. Complete hardware kit. Sheet balsa covered fuselage. FORMED PLASTIC CANOPY. ALUMINUM COWLING.

Actual photograph of model built from kit

Sterling models

1530-34 N. HANCOCK STREET
PHILADELPHIA 22, PENNA.

WRITE FOR COMPLETE CATALOG TODAY

rudder for a tight turn setting up the approach expends altitude so that it is possible to end up short, despite the ground covering glide.

It is the freedom from ballooning that points up the specifications of a still more maneuverable airplane, one that might perform outside loops even with escapements. This trait allows a radical decrease in wing loading without ill effects. It has been established that low aspect ratios are feasible; certainly, 5 to 1 is satisfactory. As much as 2 in. of chord could be added to the present wing, with a corresponding increase in airfoil thickness, and lowering of the wing loading figure. A plugged .19 would provide the additional power to offset the drag increase; perhaps a lower pitch propeller would cut down on dive speeds, enabling the ship to tuck under quicker for the outside loop attempt, before G-loads can build up to squash the plane out the bottom of the loop.

Washout proves a handicap for inverted flight at slower speeds, coming off the top of an inside loop. Washout then is wash-in. With the tendency of this section to stall at low speeds, this wash-in causes a tip to stall and the plane to roll upright. Incidentally, full down was held after this occurred once, and the ship went on around, back to the inverted position, entered an inverted flat spin, recovered, then flew aimlessly about the field, going off occasionally on different headings. All this at low speed. The proper approach to fully stuntable RC machines is to avoid washout, instead using a wedge shaped spoiler at the center section along the leading edge. This causes the center to stall first, roughly the same as making the tips stall last, but the action is the same whether the plane is on its back or right side up. This idea has been used elsewhere.

The aerodynamic balance is necessary on the rudder when the old style Bonner compound is used; high speeds do not then push the rudder back to neutral, which takes a ship unexpectedly out of a spiral. A diamond shaped opening

MAIL COUPON TODAY

for new Sterling '54 catalog . . . showing the world's finest collection of boat and plane models!

STERLING MODELS, Dept. MAN-4
1530-34 N. Hancock St.
Philadelphia 22, Pa.

Yes, I'd like to have a copy of the new Sterling catalog! Enclosed is 10c in coin to cover handling and mailing.

Name

Address

City **Zone** **State**

THIMBLE-DROME

SPACE BUG Jr.

$3.95

Performance up to 14,000 RPM. All that any pleasure flier or beginner requires! Little brother of National Champion Space Bug .049—with famous Thimble-Drome easy starting and efficient operation. Flies in any position, upright or inverted, right or left. Positively no break-in required. Needle valve away from exhaust & prop. A sensational ½A engine value.

AT ALL HOBBY DEALERS

L. M. COX Mfg. Co., Inc.

Box 476, Santa Ana, California

At your Comet dealer's in December

Kit No. SP-1

The COMET LOCKHEED Starfire F94-C

$2.49

Newest of the Comet Jet Fighters—A Flying Scale Model Designed for JETEX POWER

* 10 Formed Plastic Parts; Finished Bubble Canopy
* Lightweight Silkspan Covering
* Retractable Nose and Main Landing Gears
* E-Z-open Jet Motor Access Hatch

—and many other welcome features

Wingspan (with wing tanks) 23½"—length 25". Latest fighter ordered into production for our Air Force. Amazingly realistic model. Fuselage designed to take a Jetex 150 engine and Jetex augmenter tube for extra power. Plan provides flying instructions.

Comet Cement— Big Tube—10c

AT YOUR DEALERS

If no dealer, write directly to Dept. 35

COMET MODEL HOBBYCRAFT, INC.

501 WEST 35th STREET, CHICAGO 16, ILLINOIS

in the rudder yoke, where it rides on the escapement pin, is required to eliminate overtravel of the rudder on these escapements. This is desirable in high speed flight, because a rudder wobble from side to side when flippers are used throws the plane off its heading and slows it down. The faster the ship, the worse the consequences.

The High Diver will take any of the standard receivers on the market. We used Jack Port's 27.255 receiver for 38 flights, it, too, being under test for subsequent coverage. This receiver was hung by rubberbands attached to hooks on the corners of the chassis. Appropriate hooks can be attached inside the cabin. Some receivers can be mounted upon a block of foam rubber, held to a thin plywood slide by means of light rubberbands and hooks; the slide would go in vertically against the front cabin bulkhead. A bottom hatch is arranged just forward of the rear wheels: four intermediates fit snugly side by side, when a little wood is shaved away to provide a tight fit. Hooks and bands hold the hatch in place; make it tight so that centrifugal force won't eject the batteries out of the bottom. Two of these batteries are for heater, two for escapements. Two pencells are adequate, however, for radio, but don't cut down on escapement batteries unless flying one escapement only, in which case two pencells are enough.

This battery pack was wired to a plug and socket for quick replacement, the socket being in the botttom of the 1/16 ply floor. A K-45 67-1/2 volt B battery slides through the opening in bulkhead B-B, is packed in place. A slide receiver mount would retain the battery. A five-pin plug on the receiver cable will go into a socket placed well back on the ply floor, but from the top inside the cabin. A second 1/16 in. ply floor, matching the top view contour of the ship, extends from the firewall to bulkhead B-B, lending great strength to the nose. Note that, on the top view, various thicknesses of overlapping side sheeting may be seen forward of the wing. The mounts, forward bulkheads, and the sections of reinforcing sheeting are assembled after the one-eighth sides are in place, then the whole is sanded to the proper top view shape.

The torsion bar nose wheel gear is an English development that takes any abuse. The axle extends up from each side of the wheel, then reverses itself to cross the fuselage, finally doubling back for attachment to the ply floor. The portion that is parallel to the axle, where it passes through the wheel, is placed inside a wrapping of tin, the seam of which is soldered. However, the wire itself must be free to twist.

The lower, or rudder escapement, is a Bonner compound. Make sure you have the maximum travel possible; otherwise, sufficient rudder movement may not be possible later. The elevator escapement is a self-neutralizing type, operated by means of the extra control contacts of the compound. Ours was a new Macnabb Citizen-Ship. A torsion bar linkage was found necessary as a push-pull deal did not move the flippers well enough when the plane was in extreme attitudes. With the torsion bar, the rather large counterweight on the elevators was safely eliminated; moreover, necessary large movement could be had. Be sure to note the three-point wing rubber hold-down, for the front. A single dowel is not to be relied upon; it may even break up the structure when the ship is wrung out. Escapement rubbers are accessible through holes in the bottom of the fuselage: bend a wire fitting for handling rubber.

If you have had no elevator experience, fly the ship with rudder alone, using elevator only for positioning the ship prior to a special maneuver or to achieve maneuvers not possible with rudder. A trimmable tail would allow flying by elevator. END

Radio Control News

(*Continued from page 26*)

at the apex of the fuselage, and guided by a fitting on each landing gear strut. It was recommended that 300 ft. of altitude be obtained before any maneuver other than corrective control for proper altitude was used. Generally, no violent maneuvers such as are attempted with model RC planes were executed with this target. Flying consisted of "evasive" action on the part of the ground operator and a standard pattern, flown back and forth in front of the gunners, was used.

The power plant for this plane was a twin cylinder, 6 hp, two-cycle engine, weighing about 25 lb. Rated horsepower was obtained at 3,800 rpm and the fuel consumption varied between 1.4 and 1.8 gals/hour. The fuel was fed to the engine by a pressure of about 2 lb./sq./in. in the main fuel tank. A dual ignition coil such as used on the "old type" model engines operated from a separate 6 volt supply. A 5:1 fuel/oil ratio was used. The T. O. manuals stressed care in flipping the prop because of the tandem arrangement, warming the engine up at least three minutes before launching, and in not setting the engine too lean prior to launching. Contra-rotation of the props was achieved by gears, which ran in an oil filled case.

The manual also stated that this engine was to be used for non-man-carrying RC airplanes, to be used for targets, photographic purposes or other purposes. It might be mentioned here that Jim Schenck of Pittsburgh, Pa., has obtained excellent movies using his RC Rudderbug as a camera carrier. We've seen them and to say the least, they are amazing shots.

The landing of the target plane was performed by releasing a 20 ft. parachute. This was done by pressing the 955 cycle button. A time delay of three seconds elapsed between the cutting of the ignition system and the release of the chute.

Left and right rudder and up and down elevator control were performed by geared down electric motors. The motor servo gears and limit switches were housed in an aluminum case measuring 5 7/8 x 4 3/16 x 3 in. As we have menioned in a previous column, the internal contacts and limit switches were to be cleaned with carbon-tet after every eight to ten hours of operation. The servo unit was powered by the same 6 volt battery as the receiver. One nice feature about the motors used in the servo unit was that the field was a split winding. This allowed only one battery to be used as far as reversing polarity was concerned. The small electric motors used in our model work have only one winding and therefore two sets of batteries must be used, or a rather complicated switching set-up.

When the control stick was pushed full to one position, the control would operate to its maximum position and then upon returning the stick to neutral, the control would likewise return to neutral. To obtain an intermediate position the control was held until the desired position was obtained and then the stick was "beeped" between that setting and neutral.

In summing up what we have just presented, we believe that the coming season will find attempts made at "chute" landings, more stabs at contra-rotating props, use of model radio controlled planes for aerial camera work and the carrying aloft of telemetering geiger counters. The servo system as described is basically what has been used in model RC work for the past 15 years. We hope we've given you something to think about these past two issues so let's hear your comments for the future.

New Items

This month's review of new items con-

cerns sub-miniature potentiometers which may be used for RC work.

The photo gives the sizes of available pots as compared with the size of a one-cent piece. The pots on the left side are of the screwdriver adjustment type, while those on the right may be turned by your fingers or by a knob attached to the shaft. The pots in row "A" are the familiar Centralab make and are standard equipment on Aerotrol, North American and Control Research sets and kits. Resistance values for RC work are generally 10k and 25k, although other values from 500 ohms to 10 megohms are standard, and are carried by most radio supply houses. The wattage rating is 1/10. These Centralab pots may also be obtained, on special order, with a built in ON-OFF switch capable of handling 6 1/2 amperes at 1 1/2 volts or 200 mils at 45 volts, both ratings well within the requirements of our work. These are known as Model 1 Radiohm pots.

In row "B" are pots of Clarostat manufacture and are really scaled down versions of larger potentiometers. Of excellent quality, they may be obtained in a wide range of values from about 500 ohms to 5 megohms. They have a wattage rating of 2/10. A "must" for custom equipment where cost is not too much of a factor. Also available in this Clarostat sub-miniature line is a small wire wound pot with a wattage rating of 1 1/2. Resistances range from 10 to 10,000 ohms. The composition pot is known as Series 48 and the wire wound as Series 49.

In row "C" we have two different types made by Allen-Bradley. The pot on the left can be adjusted either by a screwdriver or by turning the entire cap. A unique feature of this unit is the use of wire leads, molded into the body, for terminals. The unit on the right is another "must" for custom building and is the smallest of the regular type pots we've run across. Available from Allen-Bradley distributors in values from 100 ohms to 5 megohms, it has a wattage rating in excess of 3/10. This unit is known as the Type G Bradleyometer.

Fig. "D" is a small wire wound pot or rheostat made by Clarostat. Not necessarily a sub-miniature item, but it is compact and lightweight and will handle about 1 watt of power. Obtainable in resistance values from 2 to 1,000 ohms, it is useful for filament control and small electric motor speed control. Known as series MH.

All of the above pots weigh less than 1/4 oz. and may be ordered through any radio supply dealer handling the particular make. The 10k and 25k pots as shown at "A" may be obtained from Control Research and Berkeley Models, Inc.

One item which we believe would be a worthwhile addition to any club workshop is a tool distributed by Polk's Model Craft Hobbies of New York City. This German made precision tool will shear, bend, cut notches, form and roll tubing and put flanges on pulleys, in addition to many other operations. Complete with all tools and dies, plus sheet material and packed in a partitioned wooden case, it sells for about $39. For the RC gadgeteer who wishes to do a professional job, this looks like a good item.

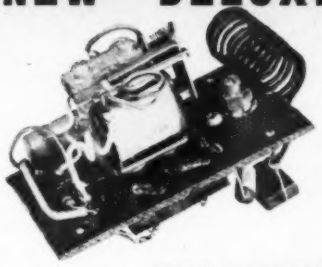
From Control Research of Hampton, Va., comes news of a revolutionary new method of presenting receiver and transmitters in kit form. As we go to press, we've learned that the transmitter we're presenting very soon will be the first in the new series. They are also handling the new Pitman electric motor for servo or similar drive use. Plenty of power on low voltages, this well known brand of motor sells for $4.50.

Last month we gave a "flight plan" for model RC boats, submitted by R. L. Brown of Ontario, Calif. To say things are moving fast in this field is putting it mildly. Mr. Brown now reports increasing interest in RC boats plus the fact that George Casselberry, Pasadena, Calif., is about finished with his Dooling .60 powered hydro job. Top speed is expected to be in excess of 90 mph and control will be handled with audio tone equipment. You may wonder what good a unit like this could be outside of a high speed model boat. During World War II, the Nazis used a radio controlled "turtle" to lumber across mine fields and detonate the mines. A high speed model boat could also be used for similar work in harbors. Don't forget that a lot of unheralded work was performed by model builders during the late war in work at the NACA and similar organizations. Radio control in our opinion offers an even wider and more exciting field now.

In photo "W" we have an example of what can be done by a beginner in the model field. Mr. E. B. Chapman, W2LDS, has constructed a Sterling Catalina Chris Craft using ED three-channel reed equipment. As can be seen in the picture, this is a very neat and well built model, and the first one at that. Mr. Chapman is now sufficiently enthusiastic about model radio control that we may have some of his new circuits, etc., in later issues. That's the idea, fellas, get a radio "ham" interested in model RC work and he's bound to come up with something new.

We'd like to hear more about what clubs are doing in the line of designing new equipment and gadgets for RC work. Don't forget, fellows, that you can't see the light of a candle hidden under a box, and it'll gradually go out from lack of oxygen. Get those ideas circulating. Send them in to the magazine for publication appraisal. If they don't make a standard article, perhaps we can work them into our column and help you out that way.

NEW "DELUXE MIDGET I" RADIO



STANDARD "MIDGET I" RADIO CONSISTS OF EXAMINATION FREE BAND TRANSMITTING RADIO, (27 M C CRYSTAL CONTROL BAND) A RECEIVER DESIGNED FOR X F G I TUBE OPERATION. THE RECEIVER WEIGHT UNDER 3½ OUNCES, AND A NEW TYPE SOLENOID PRINCIPAL OPERATION, ESCAPEMENT WHICH OPERATES BOTH RUDDER AND ELEVATORS & IS SELF NEUTRALIZING, USING NO SPRINGS NOR RUBBER FOR ITS POWER. MAY ALSO BE USED FOR BOAT OR AUTO CONTROL. OVER 2 YEARS OF ENGINEERING WORK HAVE BEEN PUT INTO ABOVE 3 UNITS. PRICE OF THE STANDARD UNITS INCLUDES A SIGMA 10,000 OHM COIL RELAY, WHICH ALONE IS WELL WORTH THE PRICE WE ASK FOR OUR SET OF PRE-FABRICATED PARTS AND OUR PLANS FOR ALL THREE UNITS. (RECEIVER SHOWN AT LEFT.)

SPECIAL INTRODUCTORY PRICE, RECEIVER TRANSMITTER AND ESCAPEMENT...$6.98 ☐

NOW AVAILABLE NEW "DELUXE MIDGET I"

NOW READY, A NEW "DELUXE MIDGET I", CONSISTS OF THE SAME HIGH POWER LONG RANGE TRANSMITTER AND SOLENOID PRINCIPAL ESCAPEMENT AS EXPLAINED ABOVE. THE RECEIVER IN THIS UNIT HOWEVER HAS BEEN CHANGED TWO WAYS IN ITS CIRCUIT (THE APPEARANCE OF THE RECEIVER HOWEVER IS SAME AS IN PHOTO ABOVE) WHICH GIVES SIMPLIER EASIER RELAY ADJUSTMENT UNDER ALL CONDITIONS. THE SAME 10,000 OHM SIGMA RELAY IS INCLUDED, AND WITH THE NEW COMPONENTS ADDED, OPERATES DEPENDABLY EVEN WHEN BATTERIES BECOME LOW ETC. WITHOUT CONTINUED RE-SETTING OR ADJUSTING. CONDENSERS, RESISTORS, ETC., & ALL PARTS IN GENERAL HAVE BEEN "HAND PICKED" GIVING A LIGHTER WEIGHT UNIT (ABOUT 3 OUNCES). "DELUXE" UNIT ESPECIALLY RECOMMENDED FOR BOAT OPERATION OR FOR EXTENDED LONG FLIGHT WORK WITH AIRCRAFT. OPERATES AUTOS EQUALLY AS WELL. THIS IS AN EXCELLENT BEGINNERS UNIT DUE TO ITS SIMPLIER, EASIER ADJUSTMENT.

"DELUXE RECEIVER TRANSMITTER AND ESCAPEMENT"..... $9.98 ☐

SIGMA RELAY IS INCLUDED WITH BOTH STANDARD AND DEULXE KITS

FREE WITH OUR DIRECTORY - Secret is out, how do we sell Midget I at such low prices? How to obtain parts at reduced cost is answer. Our Supply Source Directory tells where to obtain parts low as 1/20th list. $7.00 merchandise coupon free with directory. **Directory $1.00** ☐

PLANS FOR DELUXE MIDGET I - Regular $2.98 plans, same as with kit, printed 4 sheets.

SPECIAL PLANS - ONLY 50c ☐ **SIGMA RELAYS - SPECIAL 2.98** ☐

LATEST RADIO BOOK "RADIO CONTROL OF MODEL AIRCRAFT" - $3.98 ☐

LATEST RADIO CATALOGUE, 25c—LISTS AND SHOWS PHOTOS OF PARTS AT ½ TO ¼ THE PRICE YOU NORMALLY PAY. ALSO GIVES MORE DETAILED INFORMATION ON MIDGET I RADIOS, ETC. ALL ITEMS SHOWN ARE IN STOCK FOR QUICK DELIVERY. GIVES DETAILS ALSO ABOUT OUR DIRECTORY. **CATALOGUE 25c;** ☐

SPECIAL 10 FT. TRANSMITTER AERIAL, ONLY ..... $1.00 ☐

X F G I TUBE $3.50 ☐ | 3 A 4 TUBE $1.00 ☐ | 3 A 5 TUBE $1.35 ☐
0 TO 3 MILLAMMETER $3.50 ☐ | 0 TO 50 MILLAMMETER $2.75 ☐ | BOTH METERS $4.98 ☐
PETERSON 27 M C CRYSTAL $4.85 ☐ | TRANSMITTER CASE 4" X 5" X 3" $2.98 ☐
TRANSMITTER CASE 6" X 5" X 4" $3.98 ☐ | CASES HAVE BLACK CRACKEL FINISH.

SPECIAL SWITCH ASSORTMENT—10 ASSORTED SWITCHES, TOGGLE, PUSH BUTTON SLIDE TYPE, ETC. LIST VALUE ABOUT $8.00, ALL 10 SWITCHES.....$1.98 ☐

CHECK EACH ITEM YOU WISH TO ORDER ABOVE. PRINT YOUR NAME AND ADDRESS ON A SEPARATE SHEET OF PAPER WITH ABOVE ORDER. SEND REMITTANCE IN FULL.

RADIOMODELS, BOX 36, DEPT. MI BALTIMORE 6, MARYLAND

francisco
Racing Fuels*
HAVE WON MORE WORLD SPEED RECORDS
AND MORE FIRST PLACES IN SPEED CONTESTS
THAN ALL OTHER PREPARED FUELS COMBINED
THE ONLY FUELS
★ With Volatane Control
★ Processed to Avoid Spoilage
★ Truly Acclimatized
★ Rust and Acid-Proofed
★ Based on 30 Years Experience
POWERMIST • SPITFIRE
BLUEBLAZER • TOPSOL
Degummed Castor Oil Concentrates
*FUEL OF THE CHAMPIONS
3015 Glendale Bl., Los Angeles 39, Cal.

WEBRA Diesels NO BATTERIES NO WIRES NO FUSS NO PLUGS

The most dependable & best made Diesel Engines. Finest materials & workmanship. Easy starting every time.

WEBRA RECORD .09 CU. INCHES

Technical Details

12.95

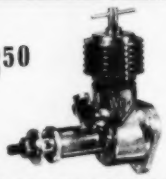
Bore: .51 in.
Stroke: .45 in.
Weight: 3 ozs.
Cap.: .09 cu. in.
1.48 cu. cms
Develops:
.18 HP at
14,500 RPM

.15 CU. INCHES WEBRA WINNER

Technical Details

Bore: 56 in.
Stroke: .64 in.
Weight: 3 ½ ozs.
Cap.: .15 cu. in.
2.46 cu. cms
Develops:
.23 HP at
11,500 RPM
.15 S, beam mounts

13.50



WEBRA MACH 1.15 CU. INCHES

Technical Details

18.50

Bore: .61 in.
Stroke: .51 in.
Weight: 4 ½ ozs.
Cap.: .15 cu. in.
2.47 cu. cms
Develops: 31 HP at
16,500 RPM
Twin ball bearing crankshaft

ARISTOCRAFT..distinctive miniatures

184 PENNSYLVANIA AVE., NEWARK 5, N. J.

SOLD BY SELECT JOBBERS EVERYWHERE
...in N. J., Conn. & N.Y.C. Area

Only by POLK'S Modelcraft Hobbies, Inc.,
Dept. MA-4 314 Fifth Ave., N. Y. 1.

America's most demanded

STUNT MOTOR

the

FOX 35

$14.95

Unexcelled performance...easy starting, light weight, steady running and durable. The choice of modelers the world over!

Flown by America's leading kit designers

BOB ELLIOT AND JIM SAFTIG...BERKELEY
HAROLD DE BOLT...DE BOLT
HI JOHNSON...KENHI

See the entire FOX line at your dealer

FOX 19 • FOX 29 • FOX 35 • FOX 59

FOX MANUFACTURING CO., INC.
7401 Varna, North Hollywood, California

FLASH! News!

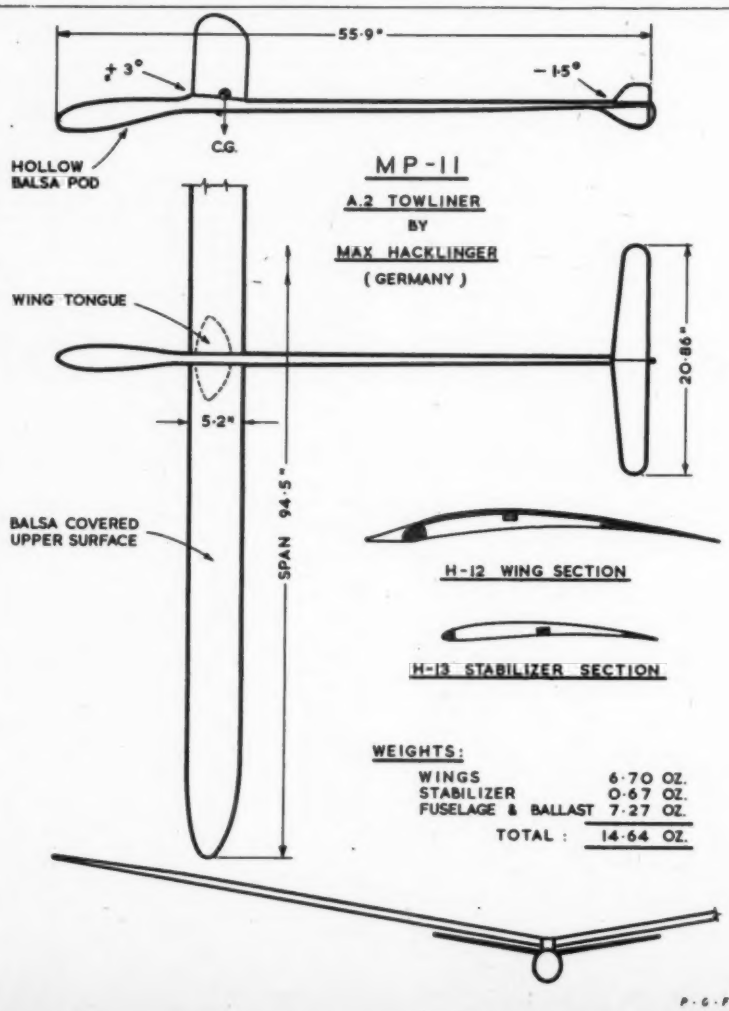
(*Continued from page 33*)

Navy is now receiving production models of the long-delayed McDonnell F3H-1N *Demon* general-purpose carrier fighter. The swept-wing fighter first flew more than two years ago and has been undergoing development tests ever since. Difficulties have been experienced with the Westinghouse J40 turbojet engine and, although initial production qualities of the airplane are being delivered with this engine, it will be replaced by the Allison J71 engine later in the year. The F3H is distinguished by its "shoulder intakes," the air inlets for the jet engine being located alongside the pilot's cockpit in order to permit use of a solid nose for electronic and armament equipment. The F3H is especially designed for use on the new *Forrestal*-class of super-carriers, the first of which will be launched this fall.

Air Force has decided that tests of FICON, the system in which a Republic F-84F *Thunderstreak* is carried in the belly of a Convair B-36D, have proved so successful that it will modify a "substantial number" of the bombers for the installation. The F-84F is mounted on a folding trapeze which rotates down out of the B-36D bomb bay and is released deep in enemy territory to provide fighter escort for the bomber over its target. After the bomber has released its bombs, the F-84F returns to hook on to the trapeze and be raised back up into the bomber's belly. The idea was tried in 1947 with the unique McDonnell XF-85 *Goblin*, which was small enough to fit entirely inside the B-36 bomb bay, but the tests did not prove satisfactory. The whole idea, however, goes all the way back to 1933 when the Curtiss F9C-2 *Sparrowhawk* was operated in regular squadron service from trapeze installations aboard the *U.S.S. Akron* and *U.S.S. Macon* dirigibles before the tragic destruction of these two giant ships.

All of us have heard about "g" loads and we know that 6g produces a rugged feeling in the stomach and that jet pilots equipped with "g-suits" can take up to 10g. The Air Force reveals, however, that its Lieut. Col. John P. Stapp has taken 46.8g for a new world's record. Riding a rocket-powered sled at Edwards Air Force Base, Calif., Col. Stapp is accelerated to 175 mph and then brought to a stop in 0.008 sec., which is about the same thing as an automobile hitting a brick wall at 120 mph. Col. Stapp is no superman, of course, and reveals the secret of his accomplishment: the terrific g-load is sustained for only a minute fraction of a second. Sustained for even several seconds, such a force would kill anybody. The tests are part of the Air Force's continuing research program aimed at adapting mere man, who apparently can't be modified or improved, to the mounting g-loads of the jet age.

This year may also become to be known as the "Turboprop Year" with no less than four different turboprop-powered aircraft scheduled to fly for the first time. The Air Research and Development Command has



been sponsoring an intensive development program of installing turboprop engines in existing production transports (rather than untried new prototypes) in order to be able to test their performance and economy against their piston-powered duplicates. Scheduled to fly in the next few months are two Boeing C-97 *Stratofreighter* transports, powered by four Pratt & Whitney T34 turboprop engines, two Lockheed C-121 *Super Constellations*, with the same four engines, one Douglas C-124 *Globemaster II*, also with the same four T34 units, and two Convair C-131 *Liner* transports powered by two Allison T56 turboprop engines. The program, in addition to providing comparative performance and economic data, will also afford invaluable maintenance, ground handling, spare parts supply and reliability data. Significantly, ARDC says that whatever it learns during the year-long tests will be made available to aircraft manufacturers and airlines of the U.S.

Second *Convair YF-102* prototype has made its first test flight at Edwards Air Force Base, Calif. This No. 2 prototype of the delta-wing, supersonic interceptor was rushed to completion well ahead of scheduled following destruction of the first prototype in a take-off accident last fall. Richard L. Johnson, former Air Force test pilot and one-time holder of the world's speed record, was at the controls and sustained serious injuries from which he is now recovered. The No. 2 airplane was taken aloft on its first flight by Convair chief test pilot E. D. "Sam" Shannon, the first man in the world to fly a delta-wing airplane (*Convair XF-92A* in 1947) and first to fly a delta-wing seaplane (*Convair XF2Y-1 Sea Dart* in 1953). Johnson will take over the *YF-102* at a later testing stage. The *YF-102* carries no armament but, instead, will carry a single Hughes *Falcon* air-to-air guided missile.

The battle between the "probe and drogue" and the "flying boom" types of air-to-air refueling has about been won by the familiar Flight Refueling, Ltd., system, in which a probe on the combat airplane is flown into a large funnel at the end of the refueling hose from the aerial tanker. The Boeing-developed "flying boom" system, in which a rigid boom was "flown" by an operator in the tanker, proved too difficult to operate in service tests in poor visibility and under turbulent air conditions. Now, Boeing itself is using the "probe and drogue" system in its *KB-47* jet tanker used to refuel a standard B-47 Stratojet bomber in flight. Further development of the idea will come with the turboprop version of the bomber, the *KB-47C*, which will mount two Wright T49 units in its inner nacelles. The turboprop engines will give the tanker the same high refueling speed as the jet tanker but with greatly increased economy. Air Force hopes, eventually, to refuel four fighters simultaneously. It has already successfully passed fuel to three at one time.

Helicopter enthusiasts are seeing their dreams come true even sooner than predicted with the report that 84 communities are now being served by helicopters. These communities have about 10 per cent of the nation's total population, the majority of them lying within the suburbs of New York, Chicago and Los Angeles. The Civil Aeronautics Board has already approved service to 46 additional communities and has applications on file from more than 40 other towns and cities. The only thing delaying such service is civil helicopter deliveries, the 84 communities mentioned above being served by only 17 machines.

Immortality has already been reserved for the venerable *Douglas DC-3*, the plane which simply will not die. But the twin-engine transport, apparently not knowing this, continues to write its apparently never-ending story. Latest chapter is a Navy contract for the modification of 100 wartime R4D aircraft to the new R4D-8 "Super DC-3" configuration. This modification includes more powerful engines, new wing panels, new empennage, streamlined nacelles and internal improvements, all of which cost $280,000 but which gives the transports a 50 per cent increase in payload and a performance improvement of 40-50 mph in speed. Already 21 years old, the DC-3 has been threatened by a potential "DC-3 replacement" a dozen times, but designers and potential purchasers always wound up their lengthy calculations with: a DC-3. With at least another five years of service assured for the R4D-8 version, the DC-3 seems destined to reach the incredible longevity record of 30 years before it finally admits its own old age.

The aerial "hot rods" are coming and engineers throughout the country are hard at work on "stripped down" lightweight fighters. Lockheed is at work on the *XF-104*, Douglas is rushing along its *XA4D* (a fighter despite its "attack" designation) and Grumman, Vought, Temco and North American have lightweight fighter projects in the works. Engineers, led by Douglas El Segundo's Ed Heinemann and the Navy Bureau of Aeronautics' Ivan Driggs, have deplored the astronomic increase in fighter weight since World War II with some single-seat fighters now in service approaching the 15-ton mark in gross weight (compared with only three to four tons for World War II fighters). Obviously, existing fighters cannot simply be stripped of their equipment in order to improve their performance, and these companies are starting out fresh with new, lightweight designs. The basic idea is rapid rate-of-climb, high ceiling and quick take-offs and, despite their light weight, the new fighters will not offer substantial speed improvements, which depend only slightly on weight. Some observers say this will be the "last round" for the piloted fighter, since the next step in the lightweight direction will be the guided missile, the lightest fighter of all. END

Fly BABCOCK

For Pleasure or Contest Honors

the Ultimate in Radio Control

INSTANT RESPONSE TO EVERY COMMAND

DICK SCHUMACHER Dean of Radio Control Modelers says: "Most reliable, easiest to handle radio control ever — and I've tried them all!"

SAME EXCLUSIVE FEATURES AS MILITARY R C

TRANSMITTER MODEL BCT-2—Crystal controlled on 27.255 m c. Separate modulator tube and audio oscillator. Loaded 3 ft. whip gives more than adequate range. Radiation indicator on panel, simply tune for maximum output.

RECEIVER MODEL BCR-3—Failure-proof military design. 3 hard tubes. Constant carrier, audio tone. Relay current change 0 to 6 Ma thru 10,000 ohm relay. Signal increases relay current. Many times the sensitivity of any other R/C set. Hermetically sealed relay, no adjustments. Non-critical antenna, tune up headphones. Exclusive Babcock design of components — rugged, virtually crash-proof! Self-contained arc suppression. Use any good tube, any escapement. Guaranteed reliable performance thru wide range of battery voltage and conditions.

COMPARE QUALITY AND PRICE

BCT-2 Transmitter Complete (less batteries)	$39.95
BCR-3 Receiver Complete	29.95
BCR-3 Installation Kit	2.95

Also Adaptable to Model Boats

CONTACT YOUR DEALER or write direct giving dealer's name.

BABCOCK • RADIO ENGINEERING, INC. 7942 Woodley Ave., Van Nuys, Calif.

WORLD'S LEADING MANUFACTURER & SUPPLIER OF R C FOR MILITARY TARGET DRONES. THE SAME HIGH MILITARY SPECIFICATIONS GO INTO ALL BABCOCK RADIO PRODUCTS

ANOTHER ATWOOD 1st
The First and Only Complete Line of Small Model
OUTBOARD and INBOARD MARINE ENGINES
WATER COOLED • AIR COOLED
ATWOOD QUALITY AIRPLANE ENGINES
DRIVES ALL MODEL WATERCRAFT UP TO 30 m.p.h.
CADET $3.95
.049 F/F $4.75 U/C $4.50
TRIUMPH $18.00
JUST LIKE THE BIG ONES . . . not toys. Precision built with finest materials.
AUTOMATICALLY WATER COOLED by ingenious propeller pickup system, even when boat is not in motion.
THE OUTBOARD ENGINE is adjustable for "circle travel" and "thrust angle" for easy mounting. Ready to hook on and go!
Now Anyone Can Run A Model Boat!
OUTBOARD
WATER COOL $9.95
AIR COOL $9.75
INBOARD
WATER COOL $5.75
AIR COOL $5.50
ATWOOD MOTORS
3716 Park Place, Montrose, Calif.

Championship Glider

(*Continued from page* 18)

The adjustable towhook consists of a piece of .036 wire soldered to a strip of tin, which has been bent around the lower keel and itself soldered. Four 1/32 in. dia. holes are drilled or pierced through the keel and the tin "sleeve" retained in the required position by a tightly fitting wire "pin." Attach a piece of 1/16 in. dia. alum. tube to the front edge of the auto-rudder, with tape and cement. Cement the 1/16 in. ply rudder horn in place, then install the auto-rudder, with a hinge of .036 wire attached to the fin. Fair in the space between the fuselage and the fin (up to the auto-rudder hinge line) with soft balsa.

Cement the 3/8 x 3/16 in. hardwood nose stiffener in place, allowing part of it to protrude through the nose former. Fill in spaces between longerons from former No's. 1 to 2 with 1/16 in. ply. Cement scrap pieces of 1/8 in. sheet between the crutch members and the upper longerons as supports for the wing retaining dowels. Cover the forward portion of the fuselage (back to former 8) with 1/16 in. sheet, starting at the sides and then going on to the flat top and "V" bottom.

The noseblock is made from two pieces of hardwood (joined at the center line). First, cut slots to accommodate the nose stiffener, then cement the two halves together. Cut the noseblock to the correct side and top profiles and cement in position on the fuselage. When dry, chisel or carve the noseblock until it mates up with the fuselage lines.

Sand fuselage quite smooth, then drill holes for the 1/8 in. dia. wing retaining dowels—cementing the latter in place. Make a 1/4 in. dia. hole in the top, between formers No.'s. 1 and 2 (the nose weight box) and plug this with a small cork. A piece of 1/16 in. dia. wire is well cemented in place to take the stab. retaining bands. Bend the lower dethermalizer hold-down wire and fasten it to the fuselage with tape and cement. Now add the hard 1/16 in. sheet stab. mounts, the pin and ply auto-rudder stops and the upper fin (after sanding to a streamlined section).

Cut the arrow-shaped auto-rudder release from a piece of tin and bend it so that it fits snugly over the end of the towhook. Tie a length of thin nylon line to the release and then thread the line through the holes in formers No's. 8-15, bringing it out through the *left* side of the fuselage. Fasten the free end of the line to the left tip of the rudder horn, so that when the arrow-shaped release is hooked on, *the auto-rudder is held at neutral*. Tension the auto-rudder with a small rubber-band (*lightly* stretched) from the right side of the rudder horn to the piece of 1/16 in. wire (see plan).

The one-piece wing (412-1/4 sq. in.) has three main parts: the flat center panel and the tip-dihedralled outer panels. Begin by cutting the lower spars to shape, trimming the ends (as shown on the plan) to allow for the dihedral. Taper both tip spars from rib No. 3 outward.

Build the center panel first, starting by slotting the trailing edge and cutting the leading edge to length. Now pin the LE, front spar (pack up 5/32 in.), rear spar (pack up 9/32 in.) and TE (pack up *front edge* 3/32 in.) in position over the plan. Cement the ply dihedral braces to the front lower spar and the TE. Cement the main ribs (1) in position and follow with the "A" half-ribs. Tilt the outermost ribs with the aid of the angle template, then cement the upper spar in place. Sheet cover the center section.

When dry, unpin the center panel and build the tips. This time, allowance must be made for the sharp tip-washout which is an important feature of this design. First, build up the curved TE from four pieces of 1/8 in. sheet—*flat over the plan*. When dry, lift up and pack up the front edge 3/32 in. at the root only. Now pack up the other end of the TE, 1/4 in. at rib No. 5, plus 3/32 in. at the front edge again. Pin the LE flat on the building board and cement rib No. 5 in place. Next, pack up the front and rear spars as determined by the height of the slots in rib No. 5 above the building board. The root ends of the spars should be packed up as for the center panel.

Add the remaining tip ribs (2-6) and half-ribs (B-F), allow to set firmly, then unpin from the building board. Now secure the completed center panel to the building board and join the two tip panels to it, carefully lining up the LE spars and TE with each other, and packing up each tip 3-3/4 in. Use plenty of cement at all the dihedral joints and then add the 1/8 in. sheet LE gussets. Cement a piece of soft balsa block to the fuselage at the wing position. Then, using the underside of the center section as a template, carve this balsa to match up with the wing undercamber.

The stabilizer (87-3/4 sq. in.) construction is conventional. Cut the LE, spar and TE to length, then notch the latter to receive the ribs. Pin the LE and TE over the plan, packing up the front edge of the TE with slightly sanded 1/16 in. sheet. Cement the ribs in place, supporting each one at the spar position with slightly sanded 3/32 in. sheet. Add the spar, followed by the cut-to-profile tips. When dry, lift up from the plan and fill in between the center ribs with soft block. Finally, carve the central block and the tips to shape, cement well the .036 double-hook (for the retaining bands) in place and also attach the dethermelized hold-down wire.

Before covering, check all cemented joints for weak spots and go over the entire framework with a piece of fine sandpaper to insure that there are no rough spots to spoil the finish. Cover the fuselage with silk and the flying surfaces with Silkspan taking particular care to attach the tissue firmly to the undercambered ribs. After water spraying in the usual way, give all parts four coats of clear dope, gently rubbing down with steel wool between each coat. To avoid warps, it's best to go to that little extra trouble and pin the flying surfaces to the building board until the dope has dried out. The original model had a red fuselage, red wing and white stabilizer.

Assemble the model, then push a long pin into the top of the wing at the center section, exactly above the balance point indicated by the large black arrow. Get a friend to hold the model by this pin (over a table), then add lead shot to the nose weight box until level balance is obtained. About 2-1/4 oz. were needed on the original model.

Super Detail
World War I
½ INCH SCALE FLYING MODELS
DESIGNED FOR CAMPUS CO2 OR RUBBER POWER
SOPWITH CAMEL SPAN 14" $1.00
OTHERS AVAILABLE IN THIS SERIES
SE5A SPAN 13 5/16" $1.00
FOKKER DRI SPAN 11 3/4" $1.00
ASK YOUR DEALER FIRST
If Ordered Direct Please Add 10c Postage
CARTER CRAFT MODELS

America's Famous Helicopters for Your Prize Collection

Official Scale Models Win Acclaim of Experts Everywhere for Authentic Detail!

HILLER HORNET $2.49
with official insignia in Army olive drab, Navy blue, and Civilian red.

THE PIASECKI $2.49
with official insignia in Army olive drab, Navy blue, Marine blue, Air Rescue Service gray, and Piasecki Workhorse silver.
With Pontoons $2.98

THE SIKORSKY $2.49
with official insignia in Army olive drab, Navy blue, Marine blue, Air Rescue Service gray, and Coast Guard yellow.
With Pontoons $2.98

So Real-looking You'll Think They're About to Take-off!

HELICOPTER GUIDE by "Les" Morris

The only book of its kind! Written by one of America's first and foremost helicopter pilots. Tells you everything you want to know about helicopters. Gives detailed, easy-to-understand instructions and diagrams on how to fly a helicopter. Jam-packed with illustrations and facts.
$2.00 PER COPY
Add 10¢ for postage and handling.

THE PIASECKI HUP $1.49
with official insignia in Navy blue, Marine blue, Army olive drab, and Air Force silver.

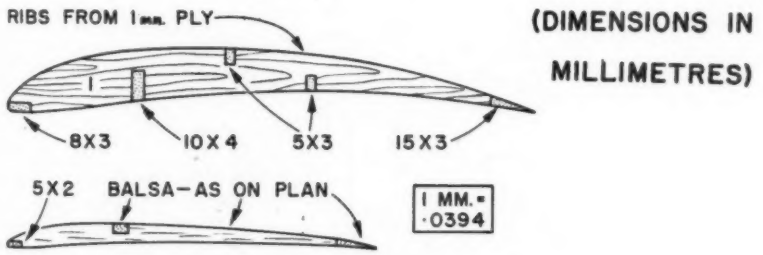
Now Own History-Making Helicopters!
Each model is precision molded, detail for detail, in sturdy polystyrene plastic. These easy-to-assemble kits include handsome display stand, detailed assembly instructions and fascinating history of the helicopter. Dramatic natural color action picture on box cover excellent for framing. They're real prizes for your plane collection.

AVAILABLE AT YOUR FAVORITE DEALER
and fine stores everywhere, or write direct to us. Enclose check or M.O. plus 25¢ for postage and handling. No C.O.D.s. Specify model and color.

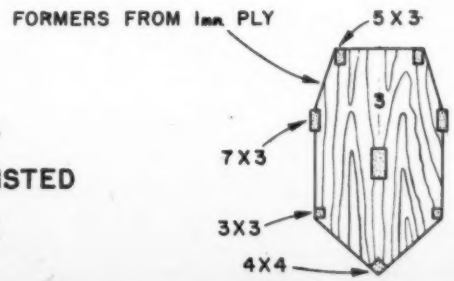
Helicopters for Industry Inc. • 111 Cathedral Avenue, Hempstead, N. Y.

The trim should be about right now, but if any slight errors in relative wing and stab. settings have crept in, it may be necessary to adjust the nose weight to get a good glide. Best results are obtained by launching from a slope to give the model time to settle into its true glide. The original model is fitted with the tow hook in the position shown on the plan, but you may find your own particular version needs a slightly different hook location, so experiment with this—and the glide trim—until you are getting the most out of your model. Remember to attach your name and address to some prominent part of the model—and get in some practice with a 164 ft. towline, because that's the length they'll be using at the 1954 A.2 World Championship in Denmark.

Finally, as regards the hardwood construction of the original model, the various material sizes are given on the accompanying sketch. The wing tips were cut from 2 mm. ply, incidentally. Dimensions are in millimeters, so the nearest fractional sizes will have to be substituted if you decide to build a spruce version. END



(DIMENSIONS IN MILLIMETRES)



THE ORIGINAL MODEL CONSTRUCTION CONSISTED LARGELY OF SPRUCE

Boom in German Engines

(*Continued from page* 13)

all models. A pressure diecast crankcase/front-bearing housing is used with a detachable rear cover. The chrome-nickel steel cylinder-liner is flanged at the exhaust belt and seats in a recess on top of the crankcase, leaving a 360° bypass passage between the outer wall of the liner and the inner wall of the case. A machined alloy finned cylinder barrel drops over the upper part of the liner and three long through-bolts secure the complete assembly to the main casting. A conical crown piston is used with a matching contra-piston. The connecting rod is a dural forging and the dural prop driver fits on a taper on the front end of the crankshaft.

The main differences between the various models, apart from size, are in the system of induction and crankshaft bearings used. The .06 cu. in. *Junior*, .09 *Record* and .15 *Blitz* are plain bearing, shaft valve motors with the intake positioned above the main bearing. The shaft-valve *Rennmotor* (racing motor) 2.5 and 3.5 c.c. (.15 and .21 cu. in.) models have their crankshafts supported in two ball journal bearings, while the *Rennmotor-Meteor* and *Rennmotor-Super* are similar but with disk valves and, of course, a rear intake. For other data, see accompanying table.

One of the most likable German engines we have yet handled is the new 1 c.c. *WAF 1*, built by Walter Fritsch at Lubars, Berlin. Externally, the *WAF* does not appear exceptional in any way: it is rather tall looking for a .06 cu. in. motor, although the finish is good. It is a shaft type rotary valve engine of medium-long stroke and has the usual variable compression head.

The performance we obtained on our torque-reaction dynamometer, however, was among the best yet recorded from Diesels of this displacement. Starting and handling

Monogram experiments with TV: Recently sponsoring for an eight-week period on WNBQ the program Hobby Time, starring Bill Healion, showed how models were built, to apply dopes and cement.

FULL-SIZE PLANS

EACH SET OF 2 PLANS FOR 25c

MAILING INSTRUCTIONS. IMPORTANT! Add 5c for postage and packaging on orders mailed 3rd Class. For First Class add 10c for postage and packaging and for Air Mail add 15c for postage and packaging, for EACH set of TWO plans. Plans available only in groups of two as listed.

MODEL AIRPLANE NEWS PLAN DEPT.
551 Fifth Ave., New York 17, N. Y.

- ☐ Enclosed is 25c for Pow Wow, Hansen's.
- ☐ Also 25c for Spooky, Slowpoke.
- ☐ Also 25c for Daredevil, Wrangler.
- ☐ Also 25c for Skeeter, Internationalist.
- ☐ Also 25c for Long Tom, Sidewinder.
- ☐ Also 25c for Zilch X, Faison.
- ☐ Also 25c for Bounder, Zephyr.
- ☐ Also 25c for Snapper, Dieselaire.
- ☐ Also 25c for Nobler, Funster.
- ☐ Also 25c for Sky Wing, Challenger.
- ☐ Also 25c for Hotter 'n That, Super Saucer.
- ☐ Also 25c for Beaver, Zenith.
- ☐ Also 25c for Half Wild Goose, Firecracker.

Name (please print)

Address

City Zone State

POW WOW **HANSEN'S**

Also Available—

SPOOKY: Hot .09 stunter by Harry Williamson. Not small, or large, but just right. Oct., '53.
SLOWPOKE: For small field flying, a realistic .09 cabin free flight by Lloyd Hunt. Oct., '53.

DAREDEVIL: For sport free flight, a low wing Half-A job along Goodyear racer lines. July '53.
WRANGLER: One of the world's best team racers, along with dope on fuels and props. July '53.

SKEETER: Half-A scale team racer. May '53.
INTERNATIONALIST: FAI, AMA F.F. May '53.

LONG TOM: F.F., .29-.35 displacement. Mar. '53.
SIDEWINDER: All balsa profile, Half-A. Mar. '53.

ZILCH X: Lightweight, large wing area, for top stunt performance for 29's, 32's. Feb. '53.
FAISON: Especially for FAI rules and Cub 14, one of the prettiest free flights ever built. Feb. '53.

BOUNDER: Speed flying record holder. Sept. '52.
ZEPHYR: Easy to build ½A free flight. Sept. '52.

SNAPPER: Simple all-balsa ½A stunter. July '52.
DIESELAIRE: Small Diesel free flight. July '52.

NOBLER: Aldrich's Plymouth stunt job. June '52.
FUNSTER: Koding's Nats free flight. June '52.

SKY WING: Free flight sport wing for AA. May '52.
CHALLENGER: Shulman's Diesel team racer. May '52.

HOTTER 'N THAT: Fox-powered stunter. April '52.
SUPER SAUCER: Soaring towline glider. April '52.

BEAVER: Controlline model for .19-.29's. Feb. '52.
ZENITH: Taibi Class A '51 Nats cabin job. Feb. '52.

HALF WILD GOOSE: Half A free flight. Dec. '51.
FIRECRACKER: Flying scale U-control. Dec. '51.

were extremely easy and power output equalled that of the best 1 c.c. engine produced in England.

Internally, the *WAF 1* shows one or two unusual features. The original system of porting, for example, uses six deep exhaust ports arranged circumferentially. The cylinder sleeve is flanged and is threaded to the crankcase, as is common with most small engines, but instead of the thread being on the lower part of the sleeve, it is cut on the outer rim of the flange, which is screwed into a widened section at the top of the case casting. This leaves an annular chamber just below the cylinder bypass entry ports. The chamber is fed by six bypass passages milled in the inside wall of the outer casting, while the cylinder ports are steeply inclined to direct gas into the upper part of the combustion chamber.

Another feature of the *WAF* which, while not original, is seldom seen on European engines, is the "square" rotary valve port. These engines are not made in large numbers but whatever the maker lacks in quantity of production seems to be made up in quality.

In our tables we have listed the *Wilo* engines made in the Russian Zone of Germany. The name "Wilo" is derived from that of the designer of these motors: Willi Otto. The *Wilo,* we have been assured by West Germans, is produced in the Eastern Zone with "state support." Whether this is true or not, the fact remains that it is the most notable engine produced in East Germany at the present time. Earlier, the famed Carl Zeiss optical works had produced a model Diesel called the *Pionier 1,* but its design was obviously much out of date and it has now been withdrawn.

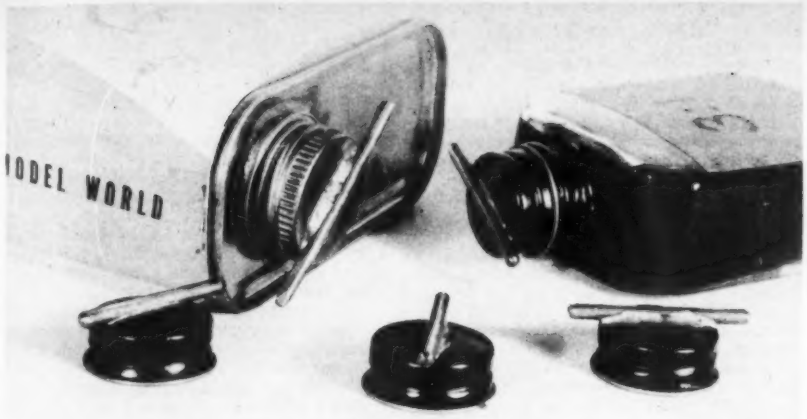
For this report, we were fortunate in being able to obtain two examples of *Wilo* engines for test and examination. The first of these was the *Wilo-Fox* model of 1.36 c.c. or .082 cu. in. and the second was the more recent crankdisc valve .149 cu. in. model. Both are variable compression Diesels.

The smaller model was the better finished, externally, of the two. It is a conventional shaft rotary-valve motor with 360° porting of the type used by the American Arden engines; i.e., three narrow exhaust slits and groove type bypass passages in the inside lower wall of the cylinder. The cylinder sleeve screws into the crankcase casting and an alloy finned barrel, in turn, screws over the upper part of the sleeve. The quality of the main casting is fair and the engine, while not particularly powerful, runs quite well. An unusual feature is the fact that the motor runs clockwise when viewed from the front, instead of anti-clock as with most rotary valve engines. The *Fox* has three radial mounting lugs, measures 1-3/4 in. high from center line to cylinder head and weighs slightly more than 2-1/2 oz.

The .149 cu. in. model is of greater interest because, so far as is known, it is the only motor produced with a *crankdisc* valve. In this, the carburetor throat is located at a 45° angle in the front of the crankcase below the main bearing and leads straight into the case via a port which is covered by the crankweb. The crankweb has a suitably located segment cut out which times the induction period.

This is an arrangement which has the merit of simplicity while having distinct possibilities as a means of maintaining high volumetric efficiency, but, as used in the *Wilo,* has one big drawback: the seriously unbalanced condition of the crankshaft because the crankdisc is cut away on the opposite side to the crankpin. It would not, however, be beyond the bounds of possibility to remedy this at the expense of a somewhat more complicated crankshaft design.

This *Wilo* model is remarkably compact



Good way to end leaking fuel cans that mess up the field kit, to make easy tightening or loosening of can, bottle caps without a pliers, is here suggested. Use brass rod or a short piece of nail.

TRADE TRICKS—*Fuel Container Caps*

Ordinary screw caps are difficult to tighten sufficiently by hand to prevent evaporation of fuel and especially glow plug and Diesel fuels. A simple remedy is to solder a length of 8 penny nail with the head and point cut off and rounded (or 1/8 in. diameter brass rod) to the cap. Remove the gasket first so that the heat required for soldering won't ruin it.

The best method for this type of work is the flame soldering method described in the May, 1949 issue of MODEL AIRPLANE NEWS, as it is difficult to secure enough heat for the purpose from a soldering iron unless it is an unusually large one. Smear a line of soldering paste across the center of the lid and apply some to the nail. Lay the nail in place with a 1/16 in. slice of solder on each side cut from wire solder 1/8 in. in diameter. Then play the flame over the nail and cap until the parts reach solder melting temperature. The solder will then flow along the joint between the two and form a smooth fillet along each side of the nail.

If the cap is the type that is rounded on top, a groove can be depressed in it to locate the nail and increase the effectiveness of the solder bond. All the caps in the photograph are of this type except the one on the can. Be sure, however, that the groove doesn't deform the portion of the cap which squeezes the gasket against the rim of the fuel can or the neck of the fuel bottle.

—RAY RUSHER

---

for a .15 cu. in. Diesel and measures only 1-7/8 in. from the center line to the cylinder head. The stroke/bore ratio of only .83 to 1 is among the lowest for a 2.5 c.c. class Diesel, as is the weight of only 3-1/2 oz. Power output is good, although not as high as the extravagant reports which first accompanied this engine's appearance would suggest. From our own findings, we would rate the engine at around 1/4 bhp at approx. 14,000 rpm.

Starting, we found, was quite good and flexibility exceptionally good. From a speed of 9,300 rpm on one prop (a light 10 x 5) we were able to cut right down to 2,500 by slackening off the compression one complete turn. When warmed up, however, there is a tendency for the contra-piston to "freeze" in the cylinder and moving the compression adjustment is not aided by a compression lever which is too thin and gets uncomfortably hot.

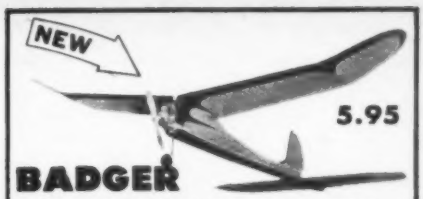
Structurally, the motor has one or two unorthodox features. The outer cylinder barrel and head, for example, screws directly into the main casting, the cylinder sleeve being sandwiched between them. The main casting actually comprises crankcase, front bearing and dual exhaust stacks. A full 360° bypass passage is arranged between the sleeve and casting and the four-segment bypass and exhaust ports cut in the cylinder liner are of identical area. The conical head piston has a dural yoke insert which carries a floating wrist pin.

One other German motor we tried was the Metro 52, produced by Metallwarenfabrik W. Mayer & Sohn of Rothenburg in the U.S. Zone. This was a shaft valve engine which was built in some numbers during 1951-52 and we were particularly well impressed with its interior finish. The output of our example did not quite come up to the .225 bhp claimed for it and we now hear that it has been withdrawn from production, but the engine had many interesting features.

Unlike most Diesels, for example, it had a counterbalanced shaft. A bronze bearing was used and the connecting rod also had a bronze bush at the crankpin end. A dural piston yoke was employed which was permanently swaged into the piston head and the nicely finished piston had two short slots in the skirt for supplementary air induction via the exhaust ports. There were nine circular exhaust ports and three inclined bypass ports. The carburetor intake was rather small and the shaft intake port consisted of two very small holes which probably restricted intake timing somewhat. All in all, however, it was a soundly made engine which was appreciably better made than most of its contemporaries.

The adoption of modern quantity production methods to cope with increasing sales will almost certainly mean Germany's becoming, eventually, a much closer third to the United States and Great Britain and, if the manufacturers and American import agents' plans and hopes materialize, increasing numbers of German-built motors, while offering no serious threat to the popularity of American makes, may be seen in the U.S.A. from 1954 onward.

END



BADGER

WING SPAN 72" CLASS A-B-C .19 TO .35 ENGINES

The easiest built freeflight on the market today, with a skyrocket climb and perfect transition from power to a table top glide. A completely new design with phenominal airfoils.

COUGAR

WIN SPAN 54" SUPER STUNT .29 TO .35 ENGINES

Designed to meet the modelers need for simple construction, while maintaining outstanding maneuverability under all conditions. Known the world over for its dependability and superior performance.

PANTHER

WING AREA 508" STUNT SPECIAL .29 TO .35 ENGINES

Spectacular flying at its best. The most beautiful stunt model that can be bought. As nice to fly as it is to build. Your friends will envy you if you fly the PANTHER.

WILDCAT

WING SPAN 37" FULL STUNT .19 TO .35 ENGINES

The backbone of the country's stunt and sport flying. More Wildcats are sold than all other models in its class. For all around sport, fly the Wildcat and you fly the best.

BUZZER'D

WING SPAN 72" RADIO CONTROL .19 TO .35 ENGINES

Written testimonials prove the Buzzer'd easier to build, easier to fly, with positive control in power and glide. Thousands of flights logged. All types of radios used successfully.

BOBCAT

WING SPAN 37" FULL STUNT .19 TO .35 ENGINES

From beginner to full stunt flyer, go the way of the Bobcat and you can't go wrong. It builds easy and it flys easy. The kit is complete and the price is right. A beginners friend.

FLY WITH

KENHI

See Dyna's 2 New Models

North American F-82 Twin Mustang **$3.50**
Grumman Cougar **2.75**

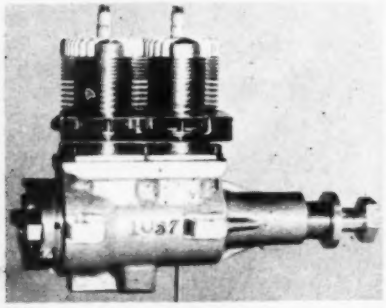
Jam-packed with metal castings, every little detail visible in the actual airplane—every single item that can be reproduced—is given to you.

JET MODELS

F9F PANTHER $2.75

F-86 Sabrejet	$2.75	MIG-15	$2.75
F-84 Thunderjet	2.75	F-80 Shooting Star	2.75
British Spitfire	$2.75	P-51 Mustang	$2.75
FW-190 Focke Wulf	2.75	F6F Hellcat	2.75
P-40 Warhawk	2.75	F8F Bearcat	2.75
F4U Corsair	2.75	P-38 Lightning	3.50
ME-109 Messerschmitt	2.75	P-47 Thunderbolt	2.95

DYNA-MODEL PRODUCTS COMPANY
76 SOUTH STREET OYSTER BAY NEW YORK



Displacement .55 cu. in.

2 Cylinder. .55 Cubic Inch-Alternate Firing Twin. Carburetor Controlled ..... Price $64.50
4 Cylinder. 1.10 Cubic Inch Carburetor Controlled Opposed Type Engine ..... Price $115.00
4 Cylinder to be Available in Reduction Drive to Propeller in 3 Ratios
Water Cooled Marine Engines Available in Both Models Glow Plug Ignition.

PAL ENGINEERING LTD.
53 16th Ave. S.W. Cedar Rapids, Iowa

SIG BALSA

Selected and processed specifically for model aircraft.

Precision cut, expertly graded.

OVER 300 STOCK SIZES

Now available at most dealers.

Write for free sample sheet and price list of wood and model supplies.

●

SIG MANUFACTURING CO.
Montezuma, Iowa

Tuning for Speed

(*Continued from page 22*)

compare the differences when set up for all out speed.

It is advisable to use a completely new unrun engine which has not had its working surfaces broken in, as the modifications will disturb and slightly alter all the mating parts so that the running-in process will inevitably be repeated, which doubles the quite appreciable amount of initial wear which always occurs in a new engine.

There is no "file and error" about this business, as everything to be carried out has been proved over a period of several years by many different people on many different engines. All the work is straightforward and requires no expensive equipment, but a great deal of care and concentration is essential, and at the outset one should resolve to be patient, scrupulously clean, think well, and deal with one job at a time, for in a sense one is taking over the perfection of an engine where the manufacturer finished.

The first move is to strip the engine completely and put the parts in a clean tin on a high shelf which the kids cannot reach. Always take care not to knock the components together or drop them on hard surfaces as burrs will be raised. Ball bearings should be removed by pressure on the race which is tight, rather than wherever is convenient, otherwise strain may distort the tracks out of round. The liner may be removed from the block by heating to about 300°F in the domestic oven. The rotary valve bearing pin should be tapped out with a suitable punch while the face of the rotor is resting on a perfectly flat block of metal with a hole through which the pin can drop.

First take the conrod and drill a 1/16 in. oil hole at the extreme top of the small end bearing, and countersink it slightly. Carefully file away all traces of roughness and forging flash and the numerals, etc., over the entire surface of the rod and polish it to a mirror finish.

Next the rod ends have to be simultaneously weighed. Obtain two identical coil springs of the lightest gauge available and suspend them from pins stuck in a wooden rule standing in a vertical position. The pins should be level and spaced 1-1/4 in. apart. The rod should now be hung from the springs by its bearings and the amount by which the spring supporting the big end has extended should be noted. Take about 3 in. of 18 gauge copper wire and hang it from the big end spring, having first removed the rod, and clip the wire progressively until its weight produces an equal extension to that produced by the rod. This piece of wire will now be the equivalent of the effective rotating weight of the conrod. The other spring, of course, would give the effective reciprocating weight, which for our purposes is not required.

The piece of wire should now be wrapped around the crankshaft crankpin and the shaft balanced with it in position. This may be accomplished by embedding a pair of razor blades in a block of balsa about 3/4 in. apart, edges up, and checking them for equal height with a rule, and for horizontal position with a small spirit level, while the rig is resting on a firm bench or table. The shaft is then carefully placed on the blades when it will be found to roll into a position with the crankpin downward. The object is to drill progressively a 1/8 in. hole into the crankpin of sufficient depth completely to balance the shaft so that it will rest on the blades without any tendency to roll into any particular position. The rotating mass of shaft and rod will then be in balance, and in operation, a strong gyroscopic force will be set up which will tend to dampen the vibration of the unbalanced reciprocating parts. This method, incidentally, does not apply to low revving full-size single cylinder engines, which, believe it or not, are balanced ultimately by trial and error to find the best compromise for the operating range of the engine, each balancing formula only being good for one particular speed, and even then, by no means perfect.

The rotor disc is given similar treatment by inserting the end of a piece of 3/16 in. dia. drill rod, 1 in. long, in its bearing hole and balancing it on the blades, and drilling 1/16 in. holes around the outside diameter in the appropriate places, great care being taken not to damage the valve face.

The crankdisc should now be brought to a high polish all over with fine waterproof emery paper and metal polish, and, similarly, the rotor diameter and outer face, again taking care not to touch mating surfaces.

After polishing, completely remove all traces of abrasive and check the balance, adjusting where necessary, then mount the prop driver, nut, spinner and any other rotating parts to be used on the balanced shaft, and balance them in the usual way, but only by removing weight from the component concerned. Do not alter the shaft to balance, for instance, the spinner.

The cylinder liner should next be dealt with by filing the exhaust and bypass port bars in order to widen the ports, as described in "Tuning Team Racing Engines" (MAN, Mar. '54). When filing, it is wise to watch the progress of the file inside the bore, as it is tragically easy to make the bars too narrow on the inside while still having lots of meat left outside. The minimum dimension recommended is .025 in., but if you feel at all shaky with a file, do not go below 1/32 in.

Next drill two 1/4 in. holes in the liner 1/4 in. up from the lower edge, centering them directly below the outer two of the three bypass port bars, and having removed all burrs from filing and drilling, insert the piston in the liner so that its upper edge lines up with the lower edge of the exhaust ports. Now mark through the 1/4 in. holes onto the piston with a pin point, insuring that the piston is in the correct radial position in relation with the ports, and, taking great care that the piston does not creep, drill through the piston skirt, using the liner as a drill jig. Incidentally, the drill point should only just be allowed to break through the skirt, as any further feed will bring the point into angular contact with a wrist pin boss and the drill will grab and probably cause irreparable damage.

These 1/4 in. holes in both liner and piston should finally be filed square with slightly radiused corners, and the outside edges of all the ports rounded slightly to minimize turbulence.

The piston crown should be modified in the same manner as described in the previous team racing article, so that all the exhaust ports open simultaneously. The piston rings should have the outer upper and lower edges slightly radiused with a fine file. Only the tiniest trace of metal need be removed from the rings, but the gain is quite appreciable. The rings should finally be gapped by inserting them in the bore and pushing them to one end with the piston to insure alinement, and checking the gap between the ends with feeler gauges. A gap of .003-.005 in. is about right for a new engine. If less, use the file judiciously. If more, try new rings.

The next step concerns the crankcase casting and the most tedious job of the whole project. While not vitally necessary in view of its cross-sectional area, there are a few absolute peak rpm tied up in that bypass passage, so if you want the ultimate in performance, you should carefully smooth it up with a rotary file and polish it with a small

DIRECTORY
For Hobby Dealers

CALIFORNIA—LOS ANGELES
Nationally advertised model planes, boats, trains, kits and supplies.
Weekdays and Mon.-Wed.-Fri. Eves.
PICO MODEL CO.
2540 W. Pico Blvd. DUnkirk 7-5894

CALIFORNIA—PASADENA
TRAINS—PLANES—BOATS
Complete Line
Kits—Tools—Supplies
Pasadena's Hobby Center
ACE MODEL SHOP
1655 E. Colorado St. SY 3-6061

ILLINOIS—CHICAGO
Model Airplane Engines, Kits, Supplies
HO — O — Lionel — American Flyer
Handicrafts, Boats, Cars, Tools
HOBBY CENTER
Kedzie Dept. Store
Cermak Rd. at Kedzie Ave. BI 9701

MASSACHUSETTS—CAMBRIDGE (38)
Model planes, motors, railroads, ships and accessories.
9 a.m. to 6 p.m. daily & Thurs., Sat. evenings.
CROSBY'S HOBBY CENTRE
1704A Massachusetts Ave. KI 7-4389

MISSOURI—KANSAS CITY
Model Airplane, Boat, Race Car, Hobby & Craft Supplies
Lionel, American Flyer & HO Trains & Accessories.
Sales & Service
NORTHEAST TOY & HOBBY CENTER
4825 Independence Ave. BE 7849

NEW YORK — BROOKLYN
- Full line of Planes, Cars, Boats Trains
- Full line of Accessories, Motors, Fuel, Lines, etc.
- HO 70' Layout Running now meets every Wed., 8 p.m.
- Aero Club meets Sat., 7:30 p.m.

B'KLYN HOBBY DEN
6718 Ft. Hamilton Pkwy. SH 8-6533

NEW YORK—BUFFALO
Model Airplanes—Engines—Boats
Radio Control Equipment—Handicraft
Scale Model Trains—Supplies
Open Daily Except Wed. & Sun.
Thurs. Nites Till 9
HOWARD E. RUTH
1466 Genesee St. Taylor 4126

NEW YORK—BUFFALO
Planes-Engines-Radio Control Boats
Cars—Crafts
Daily noon until 9 PM, closed Wed.
The Hobby Store Unique!
FRONTIER HOBBIES INC.
3183 Bailey Ave. AMherst 8608

OREGON—PORTLAND
PLANES—BOATS—RAILROADS
STAMPS—HANDICRAFT
VIC'S HOBBY SUPPLY
10 a.m. to 6 p.m.—Closed Sundays
1730 N.E. 40th Ave. GA 3108

PENNSYLVANIA—GETTYSBURG
Model Planes—Motors
Railroads, Ships & Accessories
Open daily 9 a.m. to 9 p.m.
Sun. 1 p.m. to 9 p.m.
We Trade
GILBERT'S HOBBY SHOP
230 Steinwehr Ave. Phone 1025
(On Route 15 to Wash., D. C.)

WASHINGTON—SEATTLE
GOOD SERVICE — HELPFUL ADVICE
Complete Stock
PLANES—BOATS—CARS—HO TRAINS
10 to 6 p.m. W. F. to 9 p.m.
Home of the Seattle Sky Hawks
BUZZ & DOUG'S HOBBY SHOP
701 E. Pike at Boylston EA 8650

mop which you will probably have to make from a nut and bolt, a couple of washers and several discs of soft cloth. Power can be supplied by an electric hand drill, but great care must be taken to avoid inadvertently chewing away parts of the barrel. The exhaust stack can also be given the same treatment, although it must be admitted that the advantage to be gained is doubtful.

A further modification to the exhaust consists of cutting away the rear side of the stack, so that gases emerging from the rear ports have an unobstructed path. However, the current belief of the writer is that cylinder distortion is thereby encouraged and since no performance gain shows on the bench, it is probable that the disadvantages offset the advantages and there is no point in doing it. In short, any work on the exhaust stack has little or no value.

Finally, the bore of the crankcase itself should be brought to a high polish, but only the portion swept by the rod, as the front and rear cover locations are accurately machined, and sloppy fits will result from polishing.

The next two operations are best performed on a lathe, although careful filing in one case, and reaming in the other, will produce the desired result. In order to reduce the required cowl width, the cylinder fins and head should be machined down to 1-1/4 in. diameter, care being taken to insure concentricity. To reduce oil drag on the crankshaft, the frontplate bore should be increased in diameter to 13/32 in. for a depth 3/8 in. starting from the front. This also helps to accommodate any slight misalinement of the bearings. If, after assembly, there is still any trace of resistance to rotation of the shaft, a new frontplate should be obtained.

The ball bearings should be thoroughly washed in clean gasoline and when dry, checked to determine that they spin freely. If they are stiff or noisy they should be replaced, and also if they rattle when vigorously shaken.

The carburetor venturi fitted to the latest .29's has a bore of 9/32 in. in comparison with the earlier types of 7/32 in. dia. The larger size should be used and the interior polished to a mirror finish. Any increase in bore size is inadvisable, particularly if you fly in a clockwise direction; however, a 5/16 in. dia. venturi can be used for counter-clockwise circuits or with pressure feed, but there is no apparent gain in performance.

Once you are satisfied that everything is as good as you can make it, the engine should be assembled once and for all, as any stripping, other than removal of the backplate and head, is harmful once the engine has been run.

Final tuning should be carried out in accordance with the method suggested in the July and August issues of MAN, but first give the engine a dozen or so runs of half a minute's duration using a medium sized prop and 30 per cent oil content fuel, and a final run on a normal speed prop to determine whether peak revs are maintained. If not, repeat the half minute runs until a constant speed can be held for two minutes, and then switch to racing fuels for compression ratio adjustments.

Ultimately, if these modifications have been carefully executed, you will have an engine which peaks at around 18,000 rpm and offers at least 15 mph more than the average stock engine.

As we go to press, Babcock Radio Engineering announces three-channel audio receiver (five controls); hand-held transmitter, built-in control stick. Details next month. END

Engine Review

(*Continued from page 32*)

the use of a very large section vertical bypass passage without overlapping the crankcase bore and maintains the external symmetry of the engine. It also takes the utmost advantage of the tendency for the moving parts to fling mixture up to the bypass ports.

Induction is handled by a 9/32 in. dia. intake of no less than 1 in. long, which provides 5/8 in. of directed airflow ahead of the spraybar and thereby enables the successful use of the large diameter and its high volumetric efficiency without impairing the fuel suction capabilities.

Since it is not possible by normal pressure die casting methods to core out a circular front rotary intake in such a way that it merges into a square section of equal or greater area where it contacts the crankshaft, most modern engines have a circular intake and a square or rectangular crankshaft port. The ideal would be rectangles in both cases, and the new Fox approaches this condition in a simple but deceptively expensive way. Instead of using the popular cast-in bearing bushing which dictates the use of a circular port, the bearing housing is reamed to a press fit for an accurately machined duralumin bushing which incorporates a rectangular port, and the thickness of the bushing therefore forms a rectangular cavity between shaft and intake which produces a shaft rotary performance closely approaching that of a disc valve.

The bushing is keyed to prevent rotation, and provision is made for lubrication of the thrust face formed by a projection of the bushing into the crankcase.

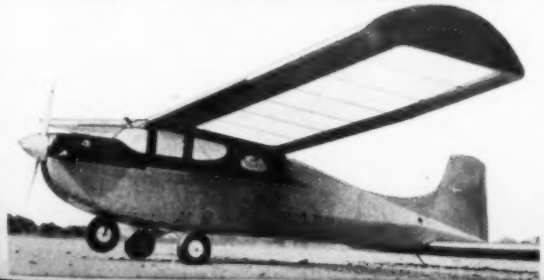
As already stated, the bypass cross-sectional area is large. In terms of square inches, it is the largest yet seen on a .19, and probably the

"THE "LIVE WIRE" Cruiser"

DE BOLT MODEL ENGINEERING CO.
WILLIAMSVILLE, N.Y.

NEW!

A fine new 100% Radio Controlled model, very realistic in appearance, exceptional in performance, high in quality.
THE MODEL WHICH WILL SET THE PACE!



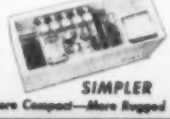
The "Cruiser" has been developed to give you "big plane" looks and appearance, combined with the fine flying qualities of our Live Wire design. In the "Cruiser" you have the ultimate in R/C design, construction and utility giving a semi-scale model capable of contest performance under any conditions. The "Cruiser's" performance is exceptional with the simplest single channel radio, yet it accommodates the fabulous multi-channel systems with ease giving even finer performance with the additional controls!

SPECIFICATIONS:
Wing Span: 65½"
Wing Area: 775 sq. inches
Wing loading: Min. 13 oz./sq. ft.; Max. 20 oz./sq. ft.
Weight ready for flight: 4 to 6 lbs.
Bare model weight: 3 lbs.
Power: .19 to .23 engines
2 or 3 wheel landing gear as desired

Kit Contents:
- ★ Full size working drawings
- ★ Complete instructions including radio installation
- ★ All necessary hardware
- ★ Dural gear
- ★ R/C Bellcrank and horn
- ★ Grade A/1 materials
- ★ Precision finished parts
- ★ Decals

Complete Kit $34.95

Exclusive Feature
New, More Compact R/C Unit
- ★ Remove entire R/C gear in less than one minute!
- ★ Allows easy bench checks and repairs on actual equipment.
- ★ Removable unit can be switched between several models!
- ★ Changes can be easily made.
- ★ Approved by all leading radio manufacturers!



SIMPLER
More Compact—More Rugged

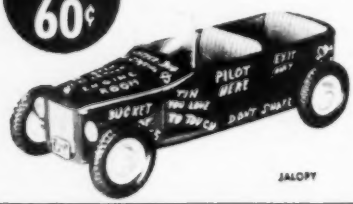
THE NEW ACE
"JALOPY"
"Jitter-Bug Special"
Companion Kit to the Famous ACE "T" ROD

Put this really EASY-TO-BUILD scale model kit together—paint and add the decals of snappy Jalopy lingo that go on the car body—then watch the gang's eyes pop out when they see it! Simplified parts, mostly ready-shaped, that anyone can handle in a jiffy. Complete plans and instructions with each kit. Get yours today!

ACE "JALOPY" KIT No. 2R

KIT COMPLETE 60¢

AT ALL MODEL AND HOBBY SHOPS



ADVT. INDEX, APRIL, 1954

Ace Products	54
Allyn Sales Co.	8
American Telasco, Ltd.	10
America's Hobby Center, Inc.	6, 7, 9
Atwood Motors	48
Berkeley Models, Inc.	55, 56
Bill's Models	34
Babcock Radio Engineering	47
Carter Craft Models	48
Cleveland Model Products Co.	39
Comet Model Hobbycraft, Inc.	44
L. M. Cox Mfg. Co.	44
Crafts and Hobbies	39, 41
Dealer Directory	53
DeBolt Model Engineering Co.	53
Dyna-Model Products Co.	52
Forster Brothers	41
Fox Mfg. Co.	46
Francisco Laboratories	45
Paul K. Guillow	2nd Cover
Gull Model Airplane Co.	38
Helicopters for Industry	49
Henry Engineering Co.	35
Herkimer Tool & Model Works, Inc.	3
Holland Products	8
K & B Mfg. Co.	3rd Cover
Kenhi Model Products	51
McCoy Products Co.	4th Cover
Mod-Ad Agency	6
Monogram Models, Inc.	4, 5
Ohlsson Mfg. Co.	39
Pactra Chemical Co.	34
Pal Engineering, Ltd.	52
Polk's Model Craft Hobbies	46
Radio Control Specialties	34
Radiomodels	45
Rich's Hobbytowne	38
Scientific Model Airplane Co.	36, 37
Sig Mfg. Co.	52
Sterling Models	42, 43
Strombeck-Becker Mfg. Co.	41
Sullivan Products	35
Testor Chemical Co.	28, 29
Top Flite Models, Inc.	40

most smoothly surfaced, but it is not by any means the widest circumferentially, neither is the bypass port, which is interesting in view of the piston baffle design. The reader will perhaps forgive us if we hop about from part to part at this stage, but nearly every component is inter-related in this most intriguing design, and the piston baffle, being of crescent shape, has a very definite bearing on the bypass arrangement.

First of all, it should be borne in mind that it is extremely difficult to produce a piston baffle of ideal contour other than by casting, and in a lapped piston engine the only acceptable and castable material is cast iron. Producing an iron casting for a .60 piston is a work of art, and for a .19 hardly worth consideration, therefore lapped pistons for small engines are almost invariably machined from bar stock and the baffle produced by a milling process, hence the popular "straight fence" design. A fault with the straight baffle is that it tends to obstruct the bypass port at either extremity, and its location is therefore a compromise. In the new Fox, a curved baffle produced by off-center turning reduces this obstructive tendency, but in so doing embraces about 200° of the piston circumference.

A logical line of reasoning, therefore, is that when a charge of mixture impinges on the center of the baffle, it will, in some degree, be deflected laterally to either side until it is squeezed upward at the points where the ends of the baffle approach the cylinder walls. The result is a charge flow somewhat similar to that produced by radial porting, but without the charge loss and timing disadvantages. The use of a circumferentially narrow bypass port is therefore directed toward increased charge velocity against the center of the baffle.

To revert to the main casting again, the cylinder barrel is machined to a slip fit for the sleeve or liner, and tapped for six cylinder head retaining screws. The exhaust stack is large, efficiently contoured and smooth surfaced. Indentations on either side of the intake indicate where holes should be drilled for a two-speed spraybar unit. Mounting lug and hole dimensions are identical with those of the Fox .29 and .35, so that all three engines are interchangeable in the same model. Last but not least, the quality and finish of the aluminum castings are flawless throughout, and that includes the tapered cooling fins.

The crankshaft is the largest, heaviest and most rigid yet seen on a .19, being 13/32 in. dia., and having 1-5/32 in. of bearing length and a 9/32 in. dia. gas passage. The crank-disc is 3/16 in. thick throughout and integral with the shaft, while the crankpin is separate and pressfitted in the disc. Counterbalancing is produced by removal of a portion of the disc on either side of the crankpin, and is especially interesting because it accurately balances all the rotating mass including the rotating portion of the conrod.

Short but substantial splines and the large shoulder entailed in the reduction of the shaft to 1/4 in. for prop attachment make a very positive location for the pressed steel prop driver. A heavy washer and standard 1/4 in. nut complete an eminently practical assembly which is in keeping with the great inherent strength of the whole engine.

An aluminum drop forging of heavy section forms the basis of the conrod. Both bearings have the same 5/32 in. diameter, but the unusual smallness of the crankpin bearing is compensated for by its extra length. This is a characteristic of all the Foxes and is undoubtedly aimed at reducing the unit rubbing area per revolution, and therefore, the friction. However, bearing loading per unit area is increased so that the net gain is doubtful. The important thing is that, though the bearing may look feeble, it does in fact stand up to hard work as well as any other tested.

The wrist pin bearing is identical and the rod is therefore reversible. The pin is of the tubular fully floating type, hardened and ground, with brass end pads, and is located in reamed holes in mid length of the piston skirt.

Apart from the baffle, piston design is conventional, being machined from solid Meehanite and slightly relieved from the wrist pin bearings downward.

The cylinder liner is a slip fit drop-in type, machined from bar stock, hardened, ground inside and out, and honed to an excellent fit and finish. The bore is relieved from 1/16 in. below the bypass ports, and is notched below the bypass for conrod clearance and easier gas flow to the bypass passage. The top end flange for axial location is not recessed into the main casting as in typical racing engine practice, but rests on the top face, and is instead recessed into the head and sealed by a self bonding gasket, and is probably the ultimate in head joint design.

A deep finned casting, contoured to conform to the baffle design, constitutes the head, and a centrally located long reach OK plug screws into an exactly flush position in relation to the combustion chamber roof.

The spraybar assembly is most interesting as it introduces yet another solution to the ticklish problem of producing accurate and concentric tapers on jet needles. The Fox needle has two knurled knobs 3/4 in. apart, one being for the fingers and the other for a spring rachet device. The end is threaded to suit the tapped spraybar and is terminated by a portion 3/8 in. long that is ground round and parallel to a diameter about .010 in. below the root diameter of the thread. This ground portion has a flat ground at an angle on one side of it in such a manner that about half of the cross sectional area is removed from the tip, and the full diameter progressively restored toward the thread. The tip lies in a closely fitting hole in the spraybar which extends along to the point where the tip resumes its full diameter. The spraybar hole then increases to the root diameter of the thread and it is at this point that the jet hole is located.

Operation of the control knob therefore moves the needle in or out and consequently moves the taper in or out of the closely fitting hole, thus allowing more or less fuel to pass.

The value of this arrangement lies in the fact that as it is easier to make accurately, it is in practice far more consistent and positive than most taper needles as a whole, and is also less liable to blockage as the flat has a self-cleaning action when rotated. It is, therefore, a well thought out contribution toward the improvement of spraybar design.

In conclusion, the new Fox .19 is an ingenious, very rugged, well finished and extremely well made engine and a significant improvement over its highly regarded Fox predecessors. Handling and performance are outstanding.

TEST: Fox .19 (1954 model)

Plug: OK Long Reach, 1-1/2 volts to start; Fuel: Supersonic 1000; Running Time prior to Test: 1-1/2 hours; Bore: .650; Stroke: .600; Weight: 4.9 oz.

Power Prop	*RPM*
10 x 6	11,500
9 x 6	12,000
7 x 10-1/2	13,150
7 x 9	14,000
7 x 8	14,500
Top Flite	
10 x 6	10,850
9 x 8	11,000
9 x 6	11,700
8 x 8	11,600
8 x 6	12,100

END

Berkeley MEANS THE BEST RADIO CONTROL EQUIPMENT & MODEL KITS!

27 m.c. Crystal Control

"SUPER AEROTROL"

RADIO CONTROL

NO OPERATORS LICENSE REQUIRED!

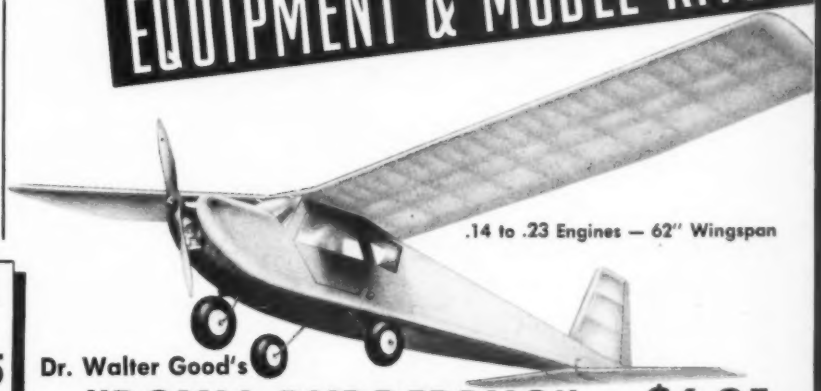
"Super-Aerotrol" is the original 27.255 Citizens Band Radio Control. Since its introduction, it has outsold all other makes. We have tested many modifications of the original "Super-Aerotrol" but present "Super-Aerotrol" under equal conditions cannot be out-performed by any similar type equipment.

COMBINATION OFFER

DE-Super Aerotrol Combination Kit—#201-K

Combination Receiver-Transmitter Kit that sells for **$29.95**

Includes everything found in both DE-202K and DE-203K Kits. By buying them together it saves you **$3.95**



.14 to .23 Engines — 62" Wingspan

Dr. Walter Good's

"ROYAL RUDDERBUG" $6.95

The entire model building world knows and respects Dr. Walt Good, many-time National R.C. Champion and re-knowned physicist. His new design is the best size for all-'round performance with single channel equipment.

The newest version of one of the most popular R.C. jobs ever designed. Simplified in construction, and improved in performance. A fine kit, produced to Berkeley's standards of completeness and engineering exactness.

READY-TO-OPERATE

SUPER AEROTROL

Including: **$49.95**

TRANSMITTER; ANTENNA; RECEIVER; ESCAPEMENT; & O-3 MILLIAMMETER.

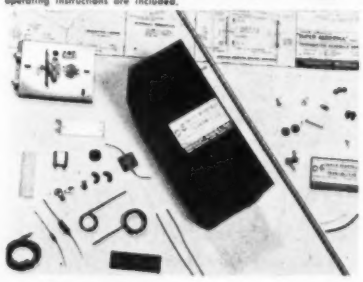
Super Aerotrol Crystal Controlled

TRANSMITTER

In Kit Form less tube **$19.95**

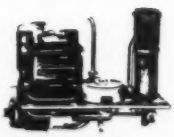
- Portable — Self contained — No separate antenna — No external Batteries!
- Operates on 27.2 mc. • Weighs 3.5 lbs.

Kit includes all necessary parts (except tube and batteries): Precision Ground Crystal; Painted Metal Cabinet; Finished Sectional Antenna; stamped and formed chassis with all holes punched; all necessary components, resistors, condensers, coils and chokes; color coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included.



"Super Aerotrol" Dust Core Tuned

RECEIVER



In Kit Form less tube **$13.95**

- NEW "locked-channel" dust-core tuning.
- Light in Weight, 2¾ oz. less batteries.
- Super-regenerator circuit, dependable.

Kit includes: Finished, tested sensitive relay; finished dust-core tuner; drilled bakelite base with condensers and eyelets attached; all electrical components, condensers, resistors, coils, chokes and potentiometer; all necessary contacts, and color-coded wiring. Can be assembled in less than two hours. Complete instructions are included.

$3.95

Variable Camber Wing for Radio Control Flying!

Slotted flaps may be depressed 10° for free-flight; depressed 25° for slow speed radio control flying; or raised 5° for high speed radio control flight.

Army Liaison YL-24

"HELIOPLANE"

For .049 to .14 Engines 38¾" Wingspan—1" Scale

$3.95

Radio Chassis

BOOTSTRAPS "A-RC"

For .09 to .14 Engines — 54" Wingspan

(Empty weight 21 oz. — Radio, Equip., 14 oz. max.)

Split rudder tab for separate trim adjustments. Clip-in prone engine mount, tri-cycle gear.

BRIGADIER "R. C.-38"

.035 to .099 Engines—38" Wingspan

This completely re-designed "½ A—A" Free-Flight may be flown as a Radio Control job, a PAA-Load model, or a free-flight Sport Flyer. **$1.95**

"SUPER BRIGADIER"

58" Wingspan—For .19 to .36 Engines

Especially designed by Henry Struck for Radio Control and PAA-Load flying. **$4.95**

buy **BERKELEY** at your local dealer!

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. MA., West Hempstead, N. Y. Please include 25¢ packing & postage.

FOUR NEW Controliners FOR '54

- Deep Drawn Metal Cowl
- Complete Full Color Decal Insignia
- Complete Metal Hardware
- Formed Landing Gear
- Rubber Wheels
- Full Size Detailed Plans
- Completely Pre-Fabricated Wood Parts

$5.95

For .19 to .36 Engines
53" Wingspan

Bob Elliot's
SEMI-SCALE STUNT
GRUMMAN "GUARDIAN"

For Stunt Events and Navy Carrier

Here is the latest design from the board of Bob Elliot, 1953 National Stunt Champ. A truly beautiful model, it is very close to actual scale, but can do the full stunt pattern with ease. When it comes to appearance, it will win top points for the exacting builder.

This great new model makes an ideal Carrier event airplane, as it handles so easily! No trouble catching the arresting gear with this model.

by Berkeley

Quick and Easy-to-Build!

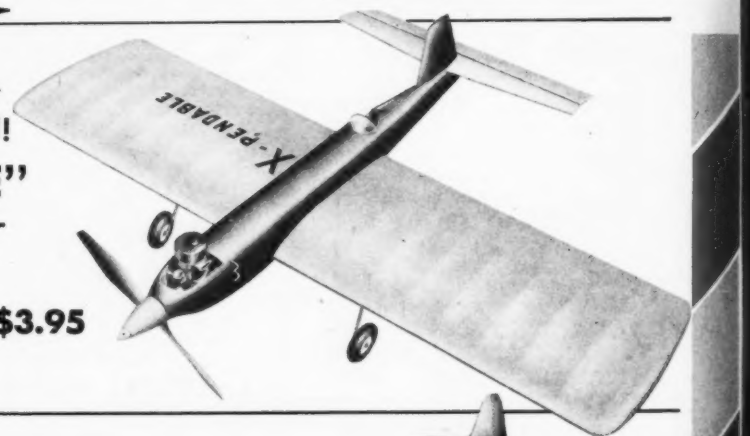
ZILCH "X-PENDABLE"

The Newest in Combat Stunt Planes—

For .19 to .35 Engines — 38" Wingspan

The Controline Combat Ship that outperforms them all. Designed and tested with typical Saftig precision. You can build it in the same time it takes to build a profile job, but you will have a lighter, stronger, and faster model!

Kit includes all Pre-fabricated Wood Parts; Complete Controline Hardware; Metal Landing Gear; Rubber Wheels; and FULL SIZED PLANS, detailed as only Berkeley details them.



$3.95

$1.95

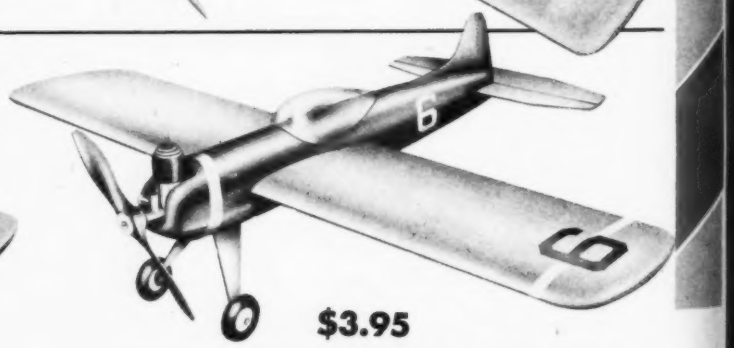
Controline Trainer — Super Pre-Fabricated!

"JUNIOR PUDDLE-JUMPER"

For .049 to .075 Engines — 19" Wingspan

The "Junior Puddlejumper" employs proven Jim Walker "U-Control." The plans show all the details for installing the controls. There are six progressive steps in elevator sensitivity as you progress in flying ability. In addition installations of all the most popular engines are shown on the plans.

Kit includes all Pre-fabricated Wood Parts; Complete Controline Hardware; Metal Landing Gear; Rubber Wheels; and FULL SIZED PLANS, detailed as only Berkeley details them.



$3.95

Controline Trainer — Super Pre-Fabricated!

SUPER PUDDLE-JUMPER "28"

For .09 to .23 Engines — 28" Wingspan

The "Super Puddlejumper" is a primary controline trainer model that is easy-to-build yet is light enough to perform all the basic stunt pattern. Its thick, hollow "Twin-Foil" wing with built-in box spar gives high maneuverability at medium-low speed for the beginner. At the same time it is extra rugged to resist the inevitable crashes while training.

The "Super Puddlejumper" is the ideal size for stunt training. The FULL SIZE PLANS show the installation of most of the more popular engines as well as complete controline system installation details.

buy BERKELEY at your local dealer!

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. MA, West Hempstead, N. Y. Please include 25¢ packing & postage.

Fly into SPRING WITH MORE POWER and PERFORMANCE

K&B SUPERSONIC FUELS

WORLD'S CHAMPION POWER ENGINE...

$10.95 AT YOUR HOBBY DEALER

INTERNATIONAL WORLD POWER CHAMPIONSHIPS • *CRANFIELD, ENGLAND*

FIRST FLASH! The American Team, all flying K & B Torpedo .15 Engines, won the Team Power Event and the coveted Franjo Kluz Team Power Trophy. The Americans won with a total time of 38 minutes, 47 seconds.

SECOND FLASH! Dave Kneeland, Hickman Hills, Missouri, U.S.A., flying a K & B Torpedo .15 Engine defeated 60 contestants from 14 nations to win the Individual Power Event with a perfect of three 5-minute flights.

K & B *Supersonic Fuels* **do deliver more power. Here's the proof! Championship performance in competition year after year after year. Look at the Official Record... MORE FIRST PLACES WON AT THE 1951... 1952... 1953 NATIONALS THAN ALL OTHER FUELS COMBINED!**

...a fuel for every engine... every use!

SUPERSONIC ULTRA-GLO, *for ½A engines*. . ½ pts. 55¢, pts. 90¢
SUPERSONIC 1000 . . . *for speed—it's HOT* . . ½ pts. 60¢, pts. 1.00
SUPERSONIC 100 . . . *for free flight* . . . . . ½ pts. 50¢, pts. 80¢
U-control, scale models

TORPEDO ENGINES K&B

K&B MANUFACTURING COMPANY
224 E. PALMER AVE., COMPTON, CALIFORNIA

FIRST AGAIN! A New, More Powerful*

McCOY DIESEL 9

Here's the wonderful news you've been waiting for . . .

More Powerful* because with Diesel power you get that smooth, even, *surging drive* that is found only in Diesel engines. Diesel fuel explodes under *constant* pressure and heat is exhausted in *constant* volume. Diesels start hot or cold . . . without glow plugs, without batteries. And out of this new McCoy "9" Diesel, you get amazing *extra* power—the kind you experience in *much larger* glow type engines.

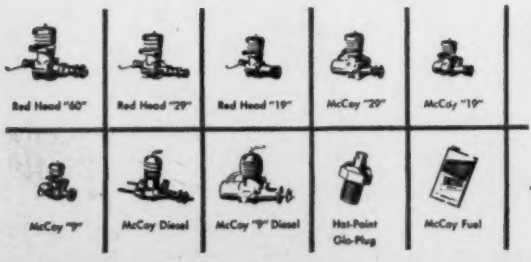
Best for every modeler because . . . a McCoy Diesel is ideally suited to free flight, radio control and control line flying. With Diesel power you can pile the extra detail on to your model . . . fly much heavier craft with this sensational little beauty. Beginner and veteran alike find it simple to operate. Just fill the tank with fast starting, full power, McCoy Diesel fuel . . . spin the prop . . . and off she goes!

And here's more good news! Just $7.95 complete with fuel tank.

SPECIFICATIONS	
BORE	.526
STROKE	.460
DISPLACEMENT	.098
WT. IN OZ.	3.0

You'd expect to pay much more for a Diesel "9" and all that extra power value you get. But it sells for only $7.95! You can't buy more for your money. So hurry right down to your hobby shop today and get yours. You'll be glad you're flying too, where . . .

The Sky's Full of McCoys



McCoy *famous "Checkered Flag" line*

McCOY®
PRODUCTS COMPANY

8509 HIGUERA STREET ★ CULVER CITY, CALIFORNIA